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CLINICAL POINTS IN EXAMINATION OF THE COW FOR TUBERCULOSIS*

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Tuberculosis is a disease which refuses to follow any rules consistently. It can assault any organ or tissue, either by stealth or by storm. Lesions which in one case produce manifest illness, in another seem to have no effect on general health. With such a disorderly opponent, the variations in clinical presentation demand flexibility in methods of diagnosis, and, quite obviously, standards of accuracy will vary. The odds against any British cow having a lesion somewhere, are six to four, according to recent estimates, and a few practitioners are prepared to bet on these lines. They are on a good thing at the price, in my opinion, but it is betting with somebody else's money. From accepting all comers, the next step upwards in making a diagnosis is to rely on clinical instinct. A walk round any ordinary dairy herd will usually result in one or more of the animals drawing attention as likely to be a "wrong 'un." What is it that catches the eye? Often we do not know. Analysis of clinical instinct is very desirable, but it is also very difficult. The surprising thing to me is that it is so frequently right without any justification in science for being so. In a disease of the nature of tuberculosis, where the clinical diagnosis seldom rests on one clear sign, but is made up of the sum of several minor observations, an attempt to define the means by which we arrive at a decision is always hampered by this immensurable factor. Some of it is contained in the signs which cattle dealers love, and which they impart to the novice with such impressive mystery—dull appearance, staring coat, dusty back, tightness of hide, dipping to spinal pressure, elbows out, poking of the nose, moving "in a piece." If one were to tabulate all the signs which have been claimed as suggestive of tuberculosis, giving each sign a certain value, and fixing a hundred points as establishing a diagnosis, none of these would be worth five points, some would be accorded none. But, though it is contrary to all one's scientific prejudice, the table would have to contain an item, "undefined clinical instinct," worth, perhaps, ten points. The negative signs, such as fat condition, visible evidence that a cow licks herself all over, a loud bawl, have a correspondingly small value. Perhaps someone of long experience will expound the significance of a cow dipping when the spine is pinched. To me it conveys nothing, which is a pity, because it is so clear and easy to evoke.

In cases which are amenable to the Tuberculosis Order, clinical suspicion can, and should, nearly always be confirmed microscopically. Most practitioners will agree with that so far as the udder is concerned, and prefer to rely on a pathologist rather than trouble to examine the organ, whereas many of the negative cases could be decided clinically. Other forms of the disease are generally determined on clinical grounds alone, which again is hardly to be upheld. In emergencies the clinician sometimes has to act on very scanty evidence, but tuberculosis is not an emergency condition, and action on clinical instinct or on gambling lines is deplorable. The essential difference between the outlook of a general practitioner and of a pathologist is a matter of credulity. The former never quite knows that which he believes, while the latter never quite believes what he knows. The correct attitude of a clinician lies somewhere between a blind faith and a cold unbelief. I want to discuss some clinical methods and signs, with a view to separating the acceptably diagnostic from the merely suspicious, and to debate how far one is justified in relying on a physical examination alone.

An elevation of one to three degrees in temperature calls for some explanation, and if none is forthcoming is distinctly suggestive of some stages of tuberculosis. If one could obtain accurate temperature charts of any given herd over a month, I think it probable that one could diagnose tuberculosis in quite a number of cases without seeing the cows. Elevation over three degrees is less significant, and over five tends to contra-indicate, or else is associated with an acute form such as miliary infection of the lungs. It is worthy of observation in most cases, which is more than I can say of the pulse. Perhaps someone will correct me, but I find the only really good site to take the pulse is on the aorta or one of its branches, and, so far as tuberculosis is concerned, it gives me no information of value.

Respiratory rate is dependent on so many factors that it seldom conveys much. At the same time, if there is no obvious reason for a cow "blowing," it demands attention. The nature of the movements is rather more worthy of note than is the rate. The extent of action

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of the ribs and flanks in a cow at rest, is not great, nor is the wave of motion in one respiratory cycle easy to be seen; moreover, it seems to vary with the type of cow and with age. But it is certainly less subject to fleeting influences than is the rate, and, while I have no formula for its interpretation, I commend its study as worth while. An added upward effort of the belly in the latter stage of expiration, and reduced movement of the ribs at all stages, demand that the chest be examined. Now how, exactly, does one examine the bovine chest? Frankly, I start by searching the wall in front of the cow. It may not be good clinical form, but it does produce results. When the search fails to yield sputum, I turn reproachfully back to the cow.

So many careful observers have added to the general confusion in describing the results of percussion and auscultation, that I dare not attempt it. As a first step one should be able to recognise abnormality, beyond question. To estimate its nature and locality is another matter. The high squeak of a pleuritic rub is fairly easy to interpret, and good evidence of tuberculosis. Sensitiveness to intercostal pressure, or under the elbow, is suggestive of a pleural deposit, probably in an active stage, but neither its presence nor its absence justifies any clear deductions. I have spent much time in studying the transmission of sound through the chest by listening to one side while tapping the opposite ribs. No great light has dawned as yet, and I shall be grateful for any hints.

The evidence to be gained from a physical examination of the chest is never sufficient in itself to warrant a diagnosis. Taken in conjunction with other signs, it is often of the greatest importance, but generaliy one ought to check the clinical result by a microscopic test of sputum. Probably nine out of ten cases in which real suspicion is aroused will yield sputum without trouble. The cow with a loose persistent cough, such as is frequently encountered in Tuberculosis Order work, has often written her history, and signed her death-warrant on the wall in front of her. The question "Does she cough?" need seldom be put. Why ask information of a farmer, who is human and frail, when you have a good solid wall? Both are deaf to coughing, but one of them has the advantage of being dumb as well. Most sputum is found between two and four feet high, either in front or to the side of the patient. If she is in a loose-box, a search around the feeding-trough is indicated, or if there is no wall in front of the standing, some practitioners have her tied on one for the night, and see her the following day. When a cow fails to provide sputum voluntarily, there are means for coercion. The method I prefer is to close the nostrils until a few forced inspirations have been taken, then release the head and await results. A little manual stimulation of the ribs may help, but most cows with active pulmonary tuberculosis will expel sputum without more drastic measures. There are sputum-catchers made, which are rather fearsome weapons not likely to be popular. The cow may be turned out into the yard and chased to encourage cough, as well as to magnify chest sounds and movements. The really zealous practitioner may pass his hand into the mouth and tickle the larynx, until he has contracted a tuberculous lesion of his hand or arm, sufficient to teach him respect for the bacillus. Many drugs increase the secretion of mucus, but a specimen so forced is not likely to be rich in bacilli. So far as the Order is concerned, considering the lack of enthusiasm by local authorities, none but the more easily obtained, and more easily examined specimens assume practical importance.

I have gone into the collection of sputum at some length because its examination is well within the scope of the practitioner. Not that there are no difficulties, but the results obtained are out of all proportion to the small amount of trouble that is needed, and the microscope is more exact than the most highly trained clinical perceptions. Examination of fæces for bacilli which have been coughed up and swallowed, or for Johne's bacilli in scouring cases, is rather too complicated for most people, but is quite within the bounds of reason for an experienced microscopist. I have never found a swab of nasal mucus to be at all helpful.

To return to the clinical. The examination of the abdomen for lesions of tubercle can only be done from inside. When one encounters a case which presents no other definite signs, a rectal exploration is demanded. In order of procedure, one feels the condition of the uterus, the left kidney, the surface of the rumen, the left and right iliac glands, while a search of the mysterious region lying downwards and to the right may give some information, though not much. If, after this, one has gained nothing, one is entitled to feel hurt. The real reward is when the rumenal surface is covered with a tuberculous deposit, which is not infrequent. Old and well-formed "grapes" are sometimes quite recognisable, while the early, and active stage feels as though a number of hard, isolated, small seeds had been sown on to the surface. One must feel it to appreciate what it means, but when the experience is gained, it will be found most valuable and accurate. No pain is evinced on handling, and we may ask why sensitivity sometimes accompanies the corresponding lesion on the pleura. Tuberculous mesenteric glands are very difficult to recognise *per rectum*. Palpation of the kidney yields no positive evidence of tubercle, and, while it is

fairly common, can only be diagnosed by an examination of urine, which is not to be recommended as a routine for the practitioner. Abnormalities of the uterus detected *per rectum*, may be of great assistance in deciding a case. The tuberculous uterus is not uncommon, and while I know of no means of deciding upon its nature by clinical signs alone, one can always go a step farther and take a swab of the cervix, or of the discharge, if present, for laboratory examination. On the other hand, many cases of ordinary, inflammatory metritis are accompanied by poor condition, cough and abnormal chest sounds, so that the typical flabby, enlarged horn, with straining on manipulation, with a wildly throbbing uterine artery, with copious and offensive discharge, must be set off against any suspicion aroused by the thinness and chest signs. It is not at all unusual, however, for latent tubercle to flare up after metritis, and the cow to die from tuberculous pneumonia, which she might have resisted had it not been for the other infection. Incidentally, Johne's disease is quite frequently attended by a short, restrained cough. I used to think that Johne's disease had a characteristic smell, until I refused a case which was clinically good enough for a text-book, but showed a tuberculous ulceration of the bowel on *post-mortem*. The hope of a rectal examination, then, consists in a clear diagnosis of tuberculous peritonitis, a recognition of uterine abnormality, or the discovery of some cause of the animal's illness other than tubercle.

The udder yields more information to a physical investigation than does any other organ. I doubt whether this is sufficiently recognised. But interpretation of findings requires considerable experience. I find that until the average man has examined about two thousand udders, he cannot be expected to appreciate the normal, and certainly cannot interpret the abnormal with accuracy and confidence. The highly developed udders with which we have to deal nowadays show tremendous variations in size, shape and texture, within what one may regard as normal physiological limits. While one must have some mental standard by which to appraise, the only true criterion for any particular quarter of a particular udder is the state of the remaining quarters. In other words, examination of an udder is essentially a process of comparison of its parts with their fellow parts, always remembering that all four quarters may be diseased simultaneously.

I do not propose to describe to you the typical tuberculous udder with its variations. Anybody encountering the typical should know that he must take a sample of milk for examination. Let me say at once that I never certify a cow to be suffering from tuberculous mastitis on clinical grounds alone. Admitted there are cases in which the possibility of error is small, the confirmation of suspicion in such is so easy that no error is justified. If I were unable to use the microscope, and at the mercy of people who insist on waiting for the biological test, then perhaps, in the client's interest, I might modify this view.

The ordinary mode of a routine examination is to glance at the cow, at the udder, and to run the hand rapidly over each quarter. If there is nothing notable, one passes on to the next. If attention is called to the udder by reason of induration or some other feature suggesting the possibility of tubercle, a minute investigation is called for, which is facilitated by following an orderly method. Palpate the whole surface of the quarter, both lightly and with pressure, comparing its texture with that of the other quarters. Look for scars and adhesions. Pass the finger up into the milk cistern at the base of the teat, if its opening is patent. Observe the surface of the teat for scars or fistula, and the end for scales or damage. Roll the teat between finger and thumb over its whole length, comparing with the remaining teats. Draw a stream of milk on to the hand, and as it pours off look for minute flakes. Compare the strength of the teat sphincter with the other three. Feel for both supramammary glands. Moving the cow's leg forward a little on the same side helps to reveal the gland when only the edge is within reach. The senses of sight and touch have been employed in the process so far. Smell and even taste are available to the enthusiast, and hearing can be used, with discretion, in listening to the owner's recital of the history of the quarter.

A detailed dissertation on the significance of various features encountered would take a very long time. I will discuss some of them briefly. Enlargement of a quarter is the least important of the accepted characteristics of the tuberculous udder. It develops later than some of the others, and is not always present in a well-advanced case. The texture of udder tissue is best appreciated by gentle palpation of the part on either side of the division between the hind quarters. Induration is the only one of the cardinal signs which is invariable in the clinically developed case, and its nature, not to be described in words, yields a great deal of evidence to the trained fingers. Everyone has his pet sign. To me, a sharply defined border to the lesion has peculiar significance. The area surrounding the base of the teat is always worthy of careful attention. In the newly-calved, "bagged up" cow, the milk cistern may be the only part of the quarter which is accessible, owing to distention and œdema. Unfortunately it is often not patent. The supramammary gland is always enlarged on the affected side in tuberculous mastitis, and the

enlargement occurs early in the attack, but it is not always palpable. I think this is sometimes due to its not having acquired that fibrous toughness which renders it easy to feel. In any case it is susceptible to so many factors other than tubercle that it is not of great value. Sometimes the enlargement is simply a physiological process. To me, its main use is to indicate which of two quarters is abnormal; is the one swollen or is the other atrophied? Where one knows, as the result of a control sample of milk proving tuberculous, that there is an offending cow within a limited group, a quest for supramammary glands may indicate the culprit before clinical abnormality of the quarter is discernible. Accessory teats are frequently responsible for indurated areas high up in the quarter. I have found an accessory teat and quarter to be tuberculous while the rest of the udder was free, but usually such indurations can be ignored. Rolling of the teat is quite one of the most fruitful of the manipulations. Perceptible thickening of the mucous lining is clear evidence of the presence of some organism other than tubercle, and if the cow lifts her leg at the handling, one knows it is recent and probably still active. I am surprised that no one has yet developed the use of an endoscope for examining the inside of teats. It would not help in a positive diagnosis of tubercle, but one can imagine it being of great assistance in other conditions, and there should be no insuperable obstacle to its use. Appreciation of the effect on a quarter of, say, a chambered teat, or a hard-drawn teat, or a fistula, or of the lesions remaining from a previous inflammatory attack or a trauma, can only be acquired by long observation. If, however, at the end of his examination, the skilful clinician has discovered good reason other than tubercle, for an abnormal quarter, I hold that he is justified in relying on his judgment: in fact, he is wrong in upsetting his client and adding to the slaughter of innocent guinea-pigs if he submits samples from such cases. I am assuming, not only reasonable care but skill, and that can only come by examining patients, not by sampling everything indiscriminately. Of course, one has always to keep in mind the possibility of mixed infections, which are by no means rare.

The tuberculous eye is not the rarity that one would expect, judging by the station accorded to it in literature. It takes the form of multiple isolated areas of opacity, of irregular shape, or there may be a diffuse clouding of the whole of the cornea, with injection of the blood vessels. In either case there is less lachrymation and discharge than one would expect from the appearance. It is a very useful clinical point when encountered. Inco-ordination of the muscles of the eyeball, a "swivel eye," is often associated with tuberculous involvement of the nervous system, but it is not common. If you should observe it, even in a beast superficially healthy, suspect generalised tuberculosis. On the other hand, tuberculous nodules on the skin of the legs, which are fairly frequent, are not, in my experience, associated with disease of the internal organs.

Enlarged surface glands are always worth looking for. The sub-maxillary and post-pharyngeal, responsible for snoring, are too susceptible to other influences to be of great assistance, but the prescapular and the precrural are worthy of attention. I have watched a precrural gland come into prominence and disappear again, over a period of five months, before the animal came within the provisions of the Order. The suprammary has been dealt with. There remains the small group behind the last rib, which seems to be of no clinical importance.

A diagnosis is not complete until one can specify at least one organ or tissue which is affected. Admitted, a clinical judgment may rest on the sum of many minor points; it is not worthy of the word diagnosis unless one can localise the infection to some extent. There remains the question whether the patient is amenable to the Order, or sometimes whether one should strain the law, in either direction, to suit the case. I repeat that the great majority dealt with should rest on a microscopical examination of some specimen, a course often well within the scope of the practitioner. The tuberculin test has very little use in this direction because it can neither localise nor reflect the extent of the disease.

Before closing, there are two points I should like to mention on which the views of experienced practitioners would be of value, and which urgently need ventilation. The first is the rate of progress of tuberculosis in a beast, as varied by the numerous factors to which it is susceptible. The second is the relative importance of the ways in which the disease spreads from cow to cow. Everyone who has been engaged in testing graded herds realises that it is not only the gross case which is dangerously infective. Both of these points demand team work between clinician and pathologist for their solution, and we need the information before we begin an attempt to control the disease on a national scale. While neither question comes strictly within the limits of my title, I suggest them to you for profitable discussion.

Discussion

Captain O. V. Gunning, in opening the discussion, said:—

Our President is to be congratulated on securing the services of Mr. H. T. Matthews to address our Association this afternoon on "Clinical Points in Examination of the Cow for Tuberculosis," as Mr. Matthews is a recognised authority on this subject. Bovine tuberculosis is so intimately con-

nected with the health and progress of mankind that it behoves us to do all in our power by discussion and observation to develop high clinical ability in dealing with herds that supply the milk of the nation. In discussion of this kind I feel that one important point is frequently overlooked, namely, that the author is invited only to write a paper: he is not asked to write a treatise, a book, or an encyclopædia; that being so, there must in any paper be some incompleteness, and I take it that in the paper under review nobody here realises this more than Mr. Matthews. At the same time, I conclude that after careful thought Mr. Matthews has stressed those points which, in his opinion, are either of most importance or require ventilating.

Mr. Matthews introduces his paper with a brief summary, in which he points out the variability of the progress of tuberculosis and what must therefore naturally follow, the flexibility in methods of diagnosis. He follows with a more detailed discussion of clinical methods and signs, with a view (as he says) to separating the acceptably diagnostic from the merely suspicious and to debate how far one is justified in relying on a physical examination only. He starts with the temperature, then respiration, with the examination of the chest, and with what he closely connects with it, the examination of sputum. He then discusses the examination of the abdomen (by rectal examination): this includes the uterus. This is followed by a somewhat detailed discussion on the udder, and he terminates by mentioning the tuberculous eye and surface lymph glands.

He makes it plainly clear throughout his paper that diagnosis should not rest on clinical symptoms alone, and he lays particular stress on the value of the examination of the sputum as an aid to diagnosis. I think few will disagree with these two statements; speaking for myself, the more experience one has in examining cows for tuberculosis, the more one realises the uncertainties and the chances of error that there are.

At the commencement of the paper Mr. Matthews says that tuberculosis refuses to follow any definite rules and in this connection one wonders what influences the rate of development. Is it strain to which the animal is put, or are there other factors? I am certain all of us at some time have wished to know how long a particular animal has been affected, and I should like to ask Mr Matthews if any work has been done to ascertain the shortest time in which it is possible for a freshly infected animal to reach the advanced state.

Mr. Matthews deals rather fully with what he terms "clinical instinct," a factor which cannot be measured but which unconsciously plays an important part in our arriving at a final clinical opinion. This brings to my mind the late Mr. Sydney Slocock. He once showed me his method of examining a cow's chest, and the great reliance he placed on touch in determining an unsound lung. He belonged to the old school of clinicians, who in many ways seemed to have more skill than the younger generation. I have also in mind a farmer who is nearly blind and yet buys his own cows in the open market, and who relies a great deal on touch. It therefore seems reasonable to assume that, as the water diviner has some gift out of the ordinary, so there are some individuals who have powers that are unusual. At the same time, there is always the danger of persons imagining that they have particular ability which they have not, so for most of us it is probably best to pin our faith on those things which are mainly material.

As far as Derbyshire is concerned, the average practitioner has little experience in the routine examination of herds. He is either called in where tubercle bacilli have been found in the milk of a particular herd to find the offending cow or cows, or he is called to deal with a suspected animal under the Tuberculosis Order, and he is expected there and then to decide if the animal shows or does not show definite clinical symptoms of tuberculosis. His work is much a matter of differential diagnosis, often conducted amongst much rattle of chains, bellowing, chewing, and other sounds inseparable from cow-sheds, and I am sure that the powers that be or the owner would not tolerate any second visits, as is rather suggested by Mr. Matthews.

If there is a slight rise of temperature the practitioner has to decide between the possibility of tuberculosis or perhaps foreign body, and with regard to high temperature, in practice we see a good many acute tuberculous infections immediately after calving—the temperature up to 105° or more and remaining up in spite of all that may be done. I think this alone is most suspicious, if not diagnostic.

Normal cows at times do a lot of coughing from various reasons, dusty fodder, etc., in certain stages of milk fever, in retention of the afterbirth, especially during its removal, and while irrigation of the uterus is being effected. These coughs appear to me to be merely reflex, but often they are suggestive of tuberculous infection.

I do not think the pulse is of much value in any bovine ailment. With regard to respiration, I agree with the author that the rate has no particular significance. I am, however, highly suspicious of those cows that lift badly and am of opinion that most of these are tuberculous.

I am sorry that Mr. Matthews does not deal more fully with auscultation. He says that as a first step we should be able to recognise abnormality beyond question; to estimate its nature and locality is another matter. I suggest that auscultation as a means of recognising abnormality is one of the most valuable aids in clinical diagnosis that we have, and that it will supply us with more information on which to base our final opinion than any other clinical symptom. The high squeak, varying degrees of roughness or murmur (the latter only heard at the extreme end of an inspiration or expiration), are more likely to denote tuberculosis than any other disease, and when everything sounds dead or when one can hear no air or very little air going through the lung an advanced state of disease usually exists. In these examinations I like to take time, for in many cases the râle is not constant, but once recognised it is of great value in establishing a definite opinion on the case.

At the same time, a real musical sound should always be approached with caution and will, in all probability, indicate a case of pulmonary emphysema, and I think it unwise to take such an animal under the Tuberculosis Order without confirming by a sputum examination. Foreign bodies, and abscesses the result of foreign bodies, often cause chest sounds that are indistinguishable from those heard in cattle affected with tuberculosis, and while there may be other symptoms to aid in differentiation there still remain these cases, perhaps exceptions to the rule, which make it impossible ever to be certain.

With regard to the examination of sputum, I cannot quite agree that the results obtained are out of all proportion to the small amount of trouble needed. The staining alone is rather a lengthy business, and searching also takes time and, in my experience, it is a serious tax on the busy practitioner's time.. Further, it is questionable if it is really a practitioner's job. In animals

that require valuation it appears to me to be a most necessary precaution, but in knacker animals, as the Order stands at present, I think we are quite justified in taking them on clinical evidence alone.

Mr. Matthews has given much information on the udder and there is no doubt but that on this he is an expert. In my experience so many positive udders are not typical, and my greatest difficulty perhaps is to differentiate from old lesions of summer mastitis.

Mr. Matthews in his paper says: "If, however, at the examination the skilful clinician has discovered good reason other than tubercle for an abnormal quarter I hold that he is justified in relying on his judgment. In fact he is wrong in upsetting his client and adding to the slaughter of innocent guinea pigs." What I would ask here is, Would not the microscope be sufficient in these cases? I would like to have Mr. Matthews' definite opinion with regard to the reliability of the special cell groups which are said to be of value in deciding tuberculous infection of milk, and if this method could not be used in place of guinea pigs.

In making the statement quoted, Mr. Matthews seems somewhat inconsistent, for otherwise throughout his paper he definitely advocates that clinical evidence should be substantiated by the microscope.

The value of rectal examination appears to be very limited, since the mesenteric glands cannot be palpated.

In my experience chronic tympany is almost invariably a symptom of tuberculosis. At one time I started to operate on these cases by opening the rumen and stitching to the skin (Begg's Operation), but in three successive cases I found the animals to be advanced cases of tuberculosis, and since then every case of chronic tympany upon which I have had the opportunity to make a *post-mortem* examination has been tuberculous and has involved lymph glands in the region of the œsophagus.

I find that cows which develop pyometra after calving and respond badly to treatment are usually extensively affected.

I should like to ask Mr. Matthews if he has noticed a particular bright bloom on some cattle affected with the disease. It is my opinion, or fancy, that certain cows can be picked out by this bloom on the skin, and it has occurred to me that there may be some co-relation between this and the bright flush often seen in the human subject.

With regard to surface lymph glands, in my district one fairly frequently encounters a large swelling in the parotid region near the ear. These swellings are adherent to the skin and cannot be separated from healthy tissue. I have unsuccessfully treated these conditions for actinomycosis, but from experience with cattle so affected I am now of opinion that they are tuberculous. Further, I should like to ask if the large swellings met with in the prescapular region, and about the size of a cocoanut, are tuberculous.

With regard to the ways in which the disease is spread, I have no certain knowledge, but I have been struck by the number of times I have, after taking one cow, returned to the farm a few months later to take the one standing next, and only last week a farmer said: "This is the third you have taken standing next to each other."

An eminent teacher of mine used to say in class: "You know man is very much like a monkey in so far as the spectacular appeals to him." Anthrax or foot-and-mouth disease are easy to deal with, but when it comes to an insidious disease like tuberculosis you cannot get people interested. One may talk all day to farmers regarding the danger of tubercle infection spreading from cow to cow, but in nine cases out of ten it falls on deaf ears, and until these simple things are recognised little progress will be made.

In conclusion, I desire to record my thanks to Mr. Matthews for so ably handling what is undoubtedly a difficult subject. He has condensed into a small compass of words a mass of information. He has, in a very practical way, placed before us the fundamental points regarding the clinical examination of cows for tuberculosis, and I am sure has supplied material in abundance for discussion.

Mr. W. Tweed said that it was with pleasure that he had heard Mr. Matthews speak and that he had great respect for his opinion, knowing that the subject was one of which Mr. Matthews had made considerable study. On the question of auscultation, he had to admit that the more he practised it the less information he seemed to obtain. In some cases he felt very confident; in others not at all.

He felt that it should be possible to be quite definite clinically without having to rely on microscopic or other methods, but he was tending to the opinion that routine clinical examination was not sufficient and that it might be better to rely on other methods in the control of infection in milk.

Mr. A. Levie said that he believed very much in clinical instinct and that he felt sure the gift was possessed by some. He could detect 9 out of 10 tuberculous animals without handling them.

Mr. W. T. Olver, after observing that he had come to the meeting mainly out of respect for the President, his fellow practitioner in Tamworth, stated that, with reference to tuberculosis, he frequently observed nervous symptoms, including varying degrees of paraplegia and fits. He had found auscultation a very great help in diagnosis.

Mr. L. A. Auchterlonie also strongly supported auscultation and said that through much practice he now found that *post-mortem* findings agreed in the main with those of auscultation.

Colonel W. C. Lowe, Mr. L. B. Grace and Mr. A. L. F. Mullen also contributed to the discussion.

THE REPLY

Mr. Matthews, in his reply, said he wished to acknowledge the receipt of several useful hints, and that he felt that the adverse criticisms offered were of omissions he had made.

It appeared to be clear that disagreement existed among clinicians on the question of the clinical diagnosis of non-tuberculous conditions of the udder, but he could not agree that the indiscriminate sampling of all quarters showing abnormality was either necessary or good practice. Mr. Matthews referred to his paper, where he said "I am assuming not only reasonable care, but skill," and said that he might add there the words "and sufficient evidence." The finding of evidence depended upon trained fingers and these were not likely to be acquired if diagnosis were referred to examination of samples.

With reference to Mr. Tweed's remarks, he was surprised that he should be in any doubt as to the value of routine clinical examination. He was positive that it produced quicker and more reliable results than other methods. On the question of auscultation, he had to confess that he could listen most carefully and then be astonished

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THE PATHOLOGY OF REPRODUCTION IN DOMESTIC ANIMALS*

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LECTURE No. IV.

The Rôle of the Male in the Pathology of Reproduction

Throughout history the female has been regarded as the basis of the pathology of reproduction. A few outstanding venereal diseases of domestic animals, like dourine of horses, the coital exanthema or vesicular venereal disease of horses and cattle and the venereal tumours of dogs, have been accepted as bi-sexual. In recent years these have become overshadowed by the frequent occurrence of abortion not generally attributed to the foregoing. With the advent of bacteriology it came to be believed that the vast majority of abortions were due to a specific bacterium, perhaps a special bacterium for each species of animal. Protozoa and filterable viruses were not being considered. The phenomenon of abortion is pre-eminently most abundant and destructive in dairy cows and naturally it was in them that the first efforts were made to discover the bacterium of contagious abortion. Professor Bang in 1896 found a bacillus, which he regarded as the cause of contagious abortion in cattle. His views were promptly accepted by investigators. It soon became evident that by no means all abortions in cattle could be attributed to the Bacillus of Bang. At first, those abortions in which the *Bacillus abortus* could not be found were conveniently attributed to accident, but further studies revealed that abortions were not uncommon when bacteria other than Bang's bacillus were present in the uterus. The observations of Williams, Udall, Frost and others showed beyond doubt that all abortions are the immediate consequence of utero-fœtal lesions. The lesions described could not be explained except as the result of the invasion of the tissues by bacteria or other pathogenic organisms. Hence the belief in accident as a direct cause of abortion has been generally discarded.

Studies in genital pathology soon showed that abortion is merely one of a long list of consequences of genital disease, the culminating phenomenon being sterility, or close of the breeding life. Accordingly any force which might cause abortion could also lead to sterility, retained afterbirth and an endless chain of phenomena. Contagious abortion thereupon became an inclusive term which might mean any pathology of the genital system interfering with or destroying reproduction. At first it was believed that Bang's bacillus caused all abortions in cattle which were associated with bacteria. This was necessarily modified in varying degree according to the point of view of the individual. It is now admitted that many abortions and associated phenomena occur, in the absence of that organism. The symptoms, course and termination are so alike in all that it must now be held that any law or principle applying to one is identical for the other.

The old conception of contagious abortion as a female complaint still persists and serves as a formidable obstacle in the path of progress. There are powerful reasons for perpetuating the tradition. At the beginning Bang proposed that abortion be controlled by immunisation or by quarantine and up to the present time investigators are divided into these two camps. The admission that the male plays a vital rôle in the pathology would embarrass or wreck either plan, according to the generally accepted details in the theories of the opposed camps. A thoroughly entrenched tradition becomes as sacred as a pagan god. It is undeniable that a vast majority of aborted fœtuses in all species of mammals are males. Nevertheless contagious abortion is regarded as a female disease. So the paradox appears of a disease of females which kills chiefly males.

CERTIFICATES OF HEALTH FOR DISEASED BULLS

In this problem the voice of the clinician is rarely heard. Leading investigators as a body have firmly committed themselves to the hypothesis that if the male plays any part at all, it is a very trivial one.

With the expressed purpose of silencing antagonistic views, the American Veterinary Medical Association created an abortion committee in 1918. It was to be composed of the foremost authorities on contagious abortion, who would speak through reports, which, when adopted, would constitute the official and authentic position of the membership of the

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at the *post-mortem* findings. He instanced a case where a quart of pus was found at *post-mortem*, the presence of which auscultation did not reveal. However, he strongly advocated auscultation, but personally preferred to rely on sputum examination to verify the findings. He did not consider that the negative examination of sputum was quite reliable.

association. In 1921, I took the definite stand that the sire constitutes one-half the herd unit, physiologically and pathologically as well as in pedigree, and declared that the fundamental basis for physiological reproduction consists of the mating of two sexually healthy individuals. In the following year the abortion committee in the performance of its bounden duty caused the association to go on official record that a bull, ejaculating abortion bacilli with his semen is a safe sire, if the copulation occurs on neutral ground and the cow is immediately so confined that she cannot lick her vulva until all abortion bacilli which may have been ejaculated in the semen shall have escaped. The duration of such interval is not stated. Neither did the committee cite a case in which it had been shown that a bull had ejaculated Bang's bacillus with his semen. In the genital organs of bulls, abortion bacilli have been usually, if not solely recognised only in abscesses, and from these it is improbable, if not impossible for the bacteria to get into the semen. The danger from the stand taken by the American Veterinary Medical Association, and its current acceptance, does not lie in the direct statement but in the inevitable implications. The current attitude is that the chief, and sole important cause of genital disease in cattle is Bang's bacillus. Eradicate it, and physiological reproduction is *a priori* essentially or completely assured; the breeder may then proceed to ignore with contempt every basic law of sex hygiene.

The dogma officially established by the American Veterinary Medical Association that a genitally diseased male is a physiological sire places a formidable obstacle in the path of progress in breeding. The clinician knows only too well that any observations he may record which indicate that the use of an unsound sire will result in pathological conceptions in both number and quality will be largely or wholly obscured by the pronouncement of the highly influential abortion committee and its unanimous endorsement by the association.

THE OWNER'S STAKE IN A DISEASED SIRE

Another great barrier to progress regarding the knowledge of the part played by the sexual diseases of the male in the pathology of reproduction as a whole is the attitude of some owners of famous sires, especially of racehorses. The principle involved is alike in connection with a famous sire of any species of animal, when the owner is offering the services of the sire, at a high price, to the public. The handicap in controlling sex pathology by the scientific handling of the diseased sire is often insurmountable.

FERTILITY OF VARYING DEGREES

Breeding animals of both sexes are divisible into three fairly well defined groups upon the basis of reproductive health; the totally and permanently sterile animals; those of low and uncertain fertility, and sexually healthy individuals.

There are numerous males which are totally sterile. They are of several classes. It is beside the point to discuss here double cryptorchidy and various aberrations or monstrosities of the genital system which inhibit reproduction, beyond recalling that they are, so far as known, a natural sequence to conception from a diseased sire or in a diseased uterus. The owner needs no advice regarding their disposal. There are numerous young dairy bulls which are born in a state of apparently normal development which prove totally sterile at breeding age. How frequent this may be in young beef bulls or in young males of other species, is not a matter of record. Naturally, upon the general observation that dairy cattle are genitally the most frequently and seriously diseased of all domestic animals, there are certainly more completely sterile young dairy males than in other species and breeds. With others, I have described elsewhere a bull calf, borne by a genitally unsound heifer after a long delay in conception, which was affected with abscessation of the testicles and adjacent urino-genital organs in a manner to indicate that the infection became implanted while he was yet in the diseased uterus. While he could not, apparently, have lived to breeding age, it is easily understood how less serious infection might persist and bar reproduction. This seems to occur. At least, young dairy bulls sometimes ejaculate only fragments of spermatozoa, suggesting rapid bacterial destruction.

PROGRESS MADE IN CLINICAL STUDIES

New impetus has been given recently to the question of the diseased male transmitting destructive genital infection to the female. In 1928, Professor Dr. Reisinger made careful clinical bacteriological and experimental studies of extensive outbreaks of abortion and associated pathological phenomena amongst dairy cattle in Lower Austria. The havoc commonly followed closely upon the introduction of a new community or parish (Gemeinde) bull. The malady was characterised by the appearance of a marked vulvo-vaginitis with swelling and profuse, muco-purulent genital discharge following coitus within a day or two. The symptoms abated, and usually subsided within 10 to 15 days. Later numerous cows, which had apparently conceived and did not again come in heat, developed a muco-purulent genital discharge. Clinical search revealed many cases of pyometra, in a large proportion of which there was later found a macerating fœtus, usually quite small, indicating a development of eight

to 10 weeks. It was not abortion in the ordinary sense, but fœtal death with pyometra and purulent maceration without expulsion. Further investigations revealed the presence of vesicular venereal disease, or coital exanthema; Reisinger, with excellent reasons, attributed the destructive genital disease to that infection. The type of disease was especially pernicious because of the well known fact that pyometra of long standing commonly signifies the end of reproduction, whereas in ordinary abortion a considerable proportion of cows so far recover that they may breed fairly well.

The conclusions of Reisinger were revolutionary because the vesicular venereal disease had always been regarded as a highly transmissible, fleeting malady, which interrupted the march of reproduction during its brief course of a week or two, ending in complete recovery without having caused any permanent damage.

In 1929 Lothe made a notable contribution based upon his observations in a large herd in which genital disease was extremely virulent. By the usual standards Bang's bacillus could be held responsible in only a minor degree. As in Reisinger's cases, one of the outstanding phenomena was pyometra, but no macerating fœtuses were observed in the pus. Lothe submits convincing evidence that much of the pyometra was due to one of the bulls that was used. A careful study of spermatozoa of this bull revealed no defect. That was highly significant, because as a rule such examination is very reliable; the dangerous bull reveals the fact in his spermatozoa.

Now, in 1932, comes a third paper which may pardonably be classed as epochal, contributed by Küst and Uhrig of the University of Leipzig. In their ambulatory clinic they investigated the prevalence of highly virulent and destructive genital disease with many abortions, much sterility, numerous cases of pyometra and macerating fœtuses floating in the pus, etc. Their researches included eight communes or parishes in which the bulls were owned and managed by the community (Gemeinde), and two manorial estates where the bulls were privately owned. The vesicular venereal disease (Bläschenausschlag) was definitely recognised in one or more animals in each parish and estate. Küst and Uhrig kept in the fore the search for Bang infection, and obtained one positive reaction to the agglutination test; but no positives to bacterial search. The abortions were in *early* gestation, some fœtuses not over 2 inches (5 cm.) long. Küst and Uhrig were very positive that the basic cause was the vesicular venereal disease and the agent in transmission was the infected sire.

While in the Continental European states this venereal disease has long been reportable as a specific infection subject to official control, it has not been regarded as having any significance, beyond the local lesions which quickly subside. So Hutyra and Marek speak of it as virtually harmless except for temporary suspension of breeding and some interference with lactation. The disease is not rare in dairy cattle in America; I have not observed it in beef cattle and find no reference to it in literature.

The infection is important here as an example of a highly virulent and destructive force in the pathology of reproduction which is clearly bi-sexual and transmitted to the female by the bull in coitus. There is no logical reason for the assumption that it is not merely one evidence of a general principle that any infection pathogenic for cattle may be transmitted from male to female in coitus if the semen or the exterior of the penis is contaminated with the bacterium or virus. If the Bang infection is not transmissible by coitus it is because the bacillus is not introduced into the vagina. If a bull ever ejaculates Bang's bacillus with his semen and he should copulate with an animal like the five heifers I have mentioned, which were so highly resistant that they defied intravenous and natural exposure to that organism, it is not to be feared that they would become diseased through coitus.

There are numerous young dairy bulls which arrive at breeding age totally sterile; some exhibit no sexual desire or male conformation, others have the male somatic characteristics, normal sexual desire and copulate freely but ejaculate no spermatozoa. In the former, apparently the interstitial testicular tissue, the hormone of which is regarded as being responsible for sexual desire, is not developed and presumably the formation of spermatozoa also fails. The testicles are small, the head, neck and voice are those of a neuter. In the other more common group of cases the testicles are small, quarter to half the normal volume, and histologically the tissues which should form the spermatozoa are juvenile as in cryptorchid testicles. The actual cause of the defect is undetermined. Since it has been observed entirely in dairy bulls (though it probably occurs less frequently in other males) there is ample reason for the suspicion that it constitutes the male analogue of the juvenile genital system of heifers already described, and is to be attributed to bad health in early calfhood.

STERILITY INCREASES WITH AGE

Like dairy cows, a large proportion of dairy bulls eventually become totally sterile. The causes of such total sterility have not been adequately studied. Less frequently, though not at all rarely, males of other breeds and species become totally sterile. Sometimes there is abscessation of the testicles; sometimes induration and atrophy or other changes. Inflam-

mation and abscessation of the seminal vesicles of bulls occasionally occur and bar the formation of their secretion; highly important as a fluid vehicle for the spermatozoa. In various ways the formation and discharge of spermatozoa are blocked and total sterility ensues.

The male with juvenile testicles is innocuous, and the loss is limited to the individual. He does not imperil the breeding health of other animals. Total sterility works its own control. As soon as total sterility is recognisable the breeder naturally discards the worthless sire.

Observations upon absolutely infertile males are probably responsible for much of the current misconception, that sexually unsound sires are not inimical to the health of the females bred to them or of the progeny. Numerous cases are recorded by laboratory workers of their studies of the genitalia of totally sterile males. The investigations are commonly limited to the study of the diseased organs and contribute little information as to the breeding history of the animal prior to the advent of total sterility. When an animal of either sex becomes totally infertile there is a tendency for their menace to other animals to cease. This is most marked in the male because in numerous instances he either ceases to ejaculate or to copulate. For example, genital tuberculosis of the cow may render her absolutely sterile but leaves her with undiminished sexual desire and capacity to copulate. She is extremely dangerous to the bull which may copulate with her and promptly acquires preputial, penial or peripenial tuberculosis, which destroys his power to copulate, although his basic genital organs—testicles, seminal vesicles, etc.—remain sound. The cow thus becomes, in the traditional sense, responsible for venereal tuberculosis, which she transmits to the male, while the latter, in many cases, cannot in turn transmit the disease venereally to the cow.

THE REAL MENACE

The great outstanding menace of genital disease to livestock husbandry is associated with low fertility, not with absolute infertility. The absolutely sterile animal provides no complex problem in the control of the pathology of reproduction. The individual is a complete loss which can be computed immediately and accurately. The feebly fertile animal, the bull which may get one recognisable pregnancy by three to 10 copulations with healthy cows, or the cow which shows recognisable pregnancy only after three to six months or more of breeding effort, constitutes the major peril both immediate and remote. The losses caused by sexual disease of an animal are not always readily or accurately computable. The immediate results may be estimated as soon as the diseased individual has recovered its health or has been discarded. The most serious losses are usually remote and continue to act through generations; the disease becomes an integral part of the pedigree. The principle is more readily traced in the female line.

A Holstein cow of fair pedigree gave birth as a heifer to a bull calf, her second calf was a bull, her third gestation resulted in the abortion of twins, her fourth gestation produced a viable heifer and the cow then made a world's record for butter fat. She became a nymphomaniac. I attended her for a year or two in vain. Others attempted her cure and after four years she again conceived, gave birth to a non-viable bull, after which she was discarded. I handled her one heifer for sterility during the first breeding year and she produced a viable heifer. She was again handled for sterility, conceived and produced a viable bull. She was handled a third time for sterility, failed and was slaughtered. Her one heifer in turn conceived; was in dystocia at term, the fœtus was extracted dead and the heifer died. The three viable bull calves produced by the three generations of females were sold at high prices because of their pedigree but, so far as recorded, the high cost was the only notable feature in their history. While in some instances the sexual health turns upward and an efficient breeding line of females originates from a diseased source, the reverse is more common. A genitally unsound animal of either sex is a frail and dangerous foundation for breeding, unless adequate measures are taken to break the vicious circle. My observations so thoroughly convinced me of this that in 1921 I took the definite position that the first principle in physiological reproduction consists of the mating of two sexually healthy animals. This was followed the next year by the counter statement of the American Veterinary Medical Association, cited in the foregoing, that it is not essential that the male be sexually sound. Additional data were assembled and I again defended my point in greater detail in 1923.

FACTORS LOWERING THE FERTILITY OF BULLS

As in the female, so in the male, two correlated factors occur—the depression of the individual and the presence of bacteria, viruses or other form of contagion. The basic unit in procreation on the part of the male is the individual spermatozoon which fertilises the ovum. If that spermatozoon be wanting in vigour, the resulting fertilised ovum must be correspondingly weak. Any element which depresses the vigour of the male, whether dietetic errors, excessive physical exercise (overwork), close confinement or overbreeding, inevitably affects, unfavourably, the number and vigour of the spermatozoa. It has been stated in the foregoing that

numerous dairy bulls arrive at breeding age with a degree of arrested development of the testicles which renders them absolutely sterile. It is logical to assume that a greater number suffer from a lower grade of arrest in genital development, not so readily recognisable clinically. These would be expected to be weak, their spermatozoa imperfect and their genital tract without efficient defensive powers against bacteria and viruses. This would be expected to lead to gross deficiency in number, form, structure, vigour and resistance of spermatozoa. This occurs. A fashionably bred young bull, ready for service, was offered to a prospective buyer in a foreign country. A test service was made and his semen examined. It was very scant, the spermatozoa were so few that it required much search to discover any. Those found consisted largely of detached heads, and these were abnormal in size and form. No spermatozoa could be discovered which could be suspected of being physiological. Another test was made with identical result. The breeder was definitely advised to withdraw the bull from sale, but the animal appeared so vigorous and promising in general appearance, that the breeder could not accept the advice and completed the sale. Later he refunded the price of the bull and the heavy transportation charges. Lesser defects are common in young dairy bulls and doubtless occur more rarely in beef cattle and in young males of other species. Such imperfectly developed bulls in all probability sometimes carry infection in the weak reproductive organs from early calfhood to breeding age.

Unquestionably the want of vigour in the genital organs invites infection as soon as the bull is used as a sire. Not infrequently there are definite clinical evidences of genital disease. Thus in Table V, the diseased bull was purchased in a herd where the calves were all very unhealthy. Havoc appeared among his cows as soon as he began service, and continued to the date of his slaughter. Upon examination it was found that the left seminal vesicle had abscessed and emptied into the rectum. Pending the abscessation there would logically occur a discharge of contagion with the semen, and the conclusion is essentially inevitable that the right seminal vesicle also harboured contagion and discharged it as an integral pollution of the semen. That is, diseases of paired organs have a marked tendency to be bilateral: when one ovary is cystic, the other commonly suffers similarly, salpingitis is usually bilateral, etc. As shown in the table, the bull could not be said to have been overworked, and the disaster must be attributed to factors already established when he came of breeding age.

In other bulls there are definite evidences of sexual overload, with parallel results to those observed in females. This is well illustrated in Table VI, outlining the breeding results in a registered Hereford herd. The data in Table VI are typical of the breeding histories of many males. Bull 1 was more highly regarded than Bull 2, and more heavily bred from 1913 onwards. At the outset as a two-year-old he was less heavily used than Bull 2.

These two bulls were handled alike, in the same herd. They were out of doors throughout the year, subsisted on natural forage, supplemented with a light ration of grain.

Bull 1 produced 136 bull calves and 85 heifers; Bull 2 produced 62 bulls and 44 heifers. In 1920 the heifers of Bull 1 had a total progeny of 163, while Bull 2 had 162.

Table V.

No.	Number Live Calves Born.	Average Duration Pregnancy in Days.	Services per Calf.	Duration of Gestation in Days.										Per Cent. of Abortions.
				270 days or Less.		271 to 275 Days.		276 to 280 Days.		281 to 285 Days.		286 to 290 Days.		
				No.	%	No.	%	No.	%	No.	%	No.	%	
7	30	276	4·1	6	20·	7	23·3	9	30·0	7	23·3	1	3·3	34·8
3	19	284·5	2·9	0	0	0	0	3	15·8	7	36·8	9	47·4	13·6

Table VI.
Breeding Summary of Two Hereford Bulls.

No.	Year.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	Total.
1	Copulations	8	39	82	117	73	106	106	86	64	10	691
	% Calves	100	33	34	32	27	39	27	26	28	90	32
2	Copulations	23	70	61	37	35	6	0	3	2	1	213
	% Calves	83	54	33	41	40	0	0	33	0	0	50

In his third breeding year Bull 1 made 82 copulations. The chief effect upon his fertility should appear in the following year when there occurred a decrease in his conception rate. He then copulated 117 times in 1914 with a very definite drop in fertility in 1915. At this juncture his load was decreased and in 1916 his fertility notably rose. So in general, additional sexual load is commonly reflected in the next year in the form of receding fertility. The fertility recovered in 1919-1920 when the load had been decreased.

Bull 2 was the weaker sire. He was bred three times as heavily in 1911 and almost twice as heavily in 1912 as Bull 1. The rule of advance and retreat in fertility remained as in Bull 1 until he collapsed late in 1915.

It is the common belief of dairymen that young bulls, two to three years old, are the most fertile. That is untrue of the diseased bull in Table V, but becomes apparent in Table VI. More important in Table VI is the clear implication that both animals were most successful at the outset because they had stored up energy which was drawn upon in meeting the sexual demands during the first two years. The store of energy then became exhausted and the sexual power had to be sustained from day to day by the food supply. Five years of breeding served to wreck Bull 2 beyond repair. The load imposed upon him while immature suggests the reason for his early breakdown. In the meantime he had produced far more calves in 1911-1912 than had Bull 1. Bull 2 having been the more heavily bred at first, he naturally had more heifers of breeding age in 1913-1914.

The capacity of a sire for service is modified by age, nutritive supply, exercise and an endless number of factors affecting health and vigour. The burden which one sire may bear is no criterion of the ability of any other. In Table III, page 755 (*V.R.*, July 2nd), it is perfectly clear that Group A was competent to carry a greater load than was either Group B or Group C. The principle is alike for the male. A young dairy bull arriving at breeding age with defective genital development may render an acceptable service if the burden is adapted to his strength.

Many writers on animal husbandry recommend that a mature dairy bull be assigned 100 cows. Since the average rate of copulation per recognised pregnancy rarely falls below two, this means 200 copulations per annum. The beef bulls in Table VI staggered under one-half that load and one broke down completely. It is perfectly well established that some bulls have been able to carry such a load, but according to my observations and available data, the placing of such a burden upon dairy bulls is an utterly unwarrantable risk.

Haubold records an instance where a bull with an assignment of 100 cows got 23 twin conceptions and five monsters. Since both twins and monsters must be attributed to pathological conditions, the observations of Haubold fall within logical limits. While not definitely stated by Haubold, the twin gestations probably followed the death and unseen disappearance of small fœtuses with destruction of the reproductive equilibrium, as is the rule with twins. The computation must be based upon knowledge of the individual, associated with general observations upon a large number of sires. As in females, so in males, age needs be carefully considered. Many bulls are hopelessly injured during the first and second years of breeding—at two and three years of age. Breeders are influenced in favour of early use because the young bulls, under the usual methods of handling, are conspicuously fertile, their keep is costly according to current methods, and the prices paid for the bulls are frequently very high, so that the interest on the investment urges haste in dividend earning. Reliable data upon the influence of early breeding of dairy bulls on their longevity and breeding efficiency are wanting. The principles which apply to the age at which heifers should be bred must be equally correct for bulls. It needs be granted that a copulation by the male is not at all comparable to the burden of a pregnancy by the female. The generalisation might be made that if it is advisable that a heifer be bred at 21 months to calve at 30 months, then a bull of the same age might safely serve a number of cows which would place upon him the same burden as the pregnancy of the heifer, but that is an undetermined equation. Logically it would appear highly imprudent to put a yearling bull to work and dangerous to use a two-year-old extensively.

Many owners of grade cows place a yearling or two-year-old bull at pasture with the herd. This practice is highly dangerous to the sexual health of the herd. The young bull will copulate repeatedly in rapid succession with one cow. If she chances to be in low genital health, she may continue in heat for two or more days, and, even if no other cows came in heat in the meantime, the sterile cow would be back in heat before the young bull had had adequate rest and the excessive burden is resumed. If conception occurs, the fœtus is weak and likely to die in a few weeks, subjecting the cow to all the hazards of that catastrophe.

THE DETERMINATION OF THE SEXUAL FITNESS OF THE MALE

There are three methods by which the sexual health and breeding strength of a male may be measured.

(1) The supreme test of a sire is his breeding record. The prudent breeder should on no

account fail to keep an accurate record of the services of each sire. The record should preferably be in tabular form, having a complete list of the females assigned with ruled columns for each month in the calendar year so that a glance at the table will show the degree of concentration of services at a given time and their success or failure. While the breeding record is essential in the final determination, it is wholly inadequate as an initial measure. The careful breeder will first apply other tests. The diseased bull in Table V had wrecked the herd before his dangerous character was recognised. Such disasters can be guarded against only by applying the second and third plans for determining sexual health.

(2) The physical examination of the male is of distinct value, though it has important limitations. The clinical examination reveals the presence of active disease of the genital organs as well as inherited or acquired defects, like cryptorchidy, abnormal size, form or consistency of testicles, penis and seminal vesicles. Such examination often reveals highly important diseased states, which may lower the fertility and value of the sire, or threaten the health of the herd.

(3) Next to the breeding record itself, the most accurate and valuable test of the fertility of the male is the microscopic study of the semen. The spermatozoon is the vital basis upon which the value of the sire depends. Without perfect male cells, physiological reproduction is impossible. Like all standards of diagnosis, it has its limitations. Three different standards are used.

(*a*) The most primitive and least reliable test is the abundance and motility of the spermatozoa in the freshly ejaculated semen. If spermatozoa are few or absent, or if the spermatozoa are non-motile or feebly motile, the animal is infertile. Spermatozoa may be abundant and motile, but imperfect in form, size and structure; the male therefore of low fertility and, probably, dangerous.

(*b*) A second and more important standard is the duration of the motility of the spermatozoa. Reisinger has found that the spermatozoa of a healthy bull retain their motility at room temperature for 12 to 24 hours, while those from bulls having the vesicular venereal disease become non-motile within two hours, perhaps due to the presence of the virus of that disease. In how far this is generally applicable is uncertain. Because of the sensitiveness of spermatozoa to temperature, the test should be comparative, semen of known health being used as an immediate check.

(*c*) The third and most valuable standard is the study of the fixed, stained spermatozoa under high power oil immersion. Properly prepared, defects of the spermatozoa in size, form and structure are authentically revealed. The male cells are enumerated readily and the ratio of abnormal to normal sperms determined accurately. The ratio of abnormal spermatozoa per thousand is the most valuable basis known for the accurate determination of the degree of fertility except for the highly expensive test of breeding. The examination of the stained spermatozoa eliminates in the highest available degree dangers to the male when unfit for service when rest might yet restore his value. It also reduces to the minimum the peril to the female when the defective spermatozoa menace the safety of pregnancy. The test is widely available. The semen may be procured by any intelligent layman, after simple instructions, and may be transported any distance and the examination made leisurely after several days, weeks or months. It is comparatively inexpensive and hence economically applicable to sires of ordinary value. It may be applied to groups of males, as in large herds of range cattle.

Like all tests, it has its limitations. So in Lothe's instance, the stained spermatozoa revealed no fault, but clinically the bull was dangerous. Lothe was dealing with an undetermined factor, a sort of " virus x " which may possibly have been the vesicular venereal disease. The inference is possible, from the contribution of Reisinger, that the spermatozoa while in the vas deferens were healthy, and that the virus was in the seminal vesicles or prostate gland, so that at the moment of coitus, when the fluids were united with the spermatozoa to constitute the seminal fluid, the virus became an integral part of it, and came in contact with the spermatozoa. This inference is strengthened by the further observation of Reisinger, as well as that of Küst and Uhrig that the infected sire was fertile, but the embryo or fœtus succumbed early to the virus ejaculated with the semen at the time of copulation. After ample allowance for such limitations, the study of the stained spermatozoa remains a test of unusual merit, and applied at reasonable intervals, constitutes the most reliable means known for recognising and controlling the perils of genital disease in the male. The technique for the test is comparatively simple and can be mastered by anyone with a moderate knowledge of microscopic methods.

Few examples of healthy and diseased tissues or cells exhibit greater contrasts than those which become apparent between typically healthy spermatozoa and those which are equally typically diseased. The gap between them is naturally occupied by every gradation. The principle may be well illustrated by photographs of spermatozoa from healthy and diseased stallions and bulls.

[The author here includes four photographs of spermatozoa from stallions, with comments

thereupon, in addition to those of bull spermatozoa, which alone we are enabled to reproduce. —Ed., *V.R.*]

The veterinarian dependent upon owners of badly diseased sires needs step lightly, speak softly, and handle in silence the disease transmitted to the mares.

Just how such sires render their females infertile when later bred to a healthy male has not been fully determined. It is highly probable that the greatest injury occurs in those females in which conception takes place and the embryo or very small fœtus dies and decomposes within the uterine cavity and thereby causes greater irritation than had fertilisation of the egg failed. That would parallel the observations of Reisinger and Küst with bulls affected with the vesicular venereal disease, in which the cows conceived, the small fœtuses died, macerated, and brought to a close the breeding life of the cows involved.

When an ovum of a mare becomes fertilised by a spermatozoon of an ass the only possible progeny is a mule. In rare instances the mule may breed. Even so, it remains a mule. Such hybridisation vividly portrays the inescapable part played by the spermatozoon upon the character of any resulting progeny. The breeder of horses who would knowingly mate his mares with stallions producing defective spermatozoa would not lower his prospects by mating his mares with a jackass. He might at least produce some valuable mules.

The micropathology of the semen of bulls is equally important and significant to that of stallions. The problem has been chiefly worked out by W. W. Williams and A. Savage. Naturally the chief researches have been made upon the spermatozoa of dairy bulls. In very rare instances a bull may show low fertility and high ratio of abortion associated with highly motile spermatozoa which reveal no evidences of disease when studied under the microscope by the best technique yet developed. The sexual health of the bull must then be determined by the highly expensive method of trying him out in the herd. In almost every case the safety of the bull as a sire is determinable authentically by an examination of the spermatozoa. The limitations in correct diagnosis, so far as known, lie wholly in the direction of erroneously concluding that the bull is sexually healthy when he is diseased and dangerous; no bull showing definite and extensive pathological changes in his spermatozoa has proved a fertile and safe sire.

In Fig. 1* is shown a group of spermatozoa from a highly fertile bull. The sperms are uniform in size and form and each cell stains alike in its various parts. The staining of bovine spermatozoa has been more successfully worked out than in the case of the equine cells and the parts come out far clearer. In Fig. 2 is shown some spermatozoa from a bull of very low fertility. There is gross variation in size and form of heads, bodies and tails and in manner of taking the stain. In Fig. 3 the variations are yet more gross than in Fig 2, the heads are larger, no two heads are alike and the bodies are equally variable in form. The heads reveal no differentiation in the taking of the stain by the various portions, in very sharp contrast with Fig. 1, in which each tissue comes out vividly. Fig. 4 illustrates the spermatozoa from an essentially totally sterile bull. The sperms have been arrested in development (microspermia) and have reached only a fraction of the normal size, most heads are without tails, no two are alike in size or shape or in the manner of taking the stain.

Form and colour of the progeny are influenced no more definitely by the character of the fertilising spermatozoon than are the health and vigour. It has apparently been assumed that of the many billions of spermatozoa in a single ejaculation only a healthy cell may fertilise an ovum. This invites the further error of inferring that if a sufficient number of motile spermatozoa are present in the semen to make it probable that one may reach and fertilise the ovum, the male is *a priori* a healthy sire. Clinical observation emphatically denies this. The conclusion is illogical when based upon a study of either the fresh semen or the stained spermatozoa. Highly motile spermatozoa, examined under high power, often reveal marked defects in size, form and other respects. Thus in Fig. 3 are seen some cells with spindle-shaped swellings of the middle piece, of such form and size to compel the conclusion that the sperm was separated from the sperm-forming tissues before development had been completed. It then suggests an analogy to premature birth, and clinical experience indicates that where such defects of sperms are common, the few conceptions are of scant value.

As the ratio of defective cells advances, the fertility and safety of the sire recedes. If it be assumed that, as a rule, the ovum is fertilised by the most vigorous of the spermatozoa, it must then be concluded from clinical observation that the higher the ratio of visibly defective cells, the greater the probability that the apparently healthy spermatozoa are in fact abnormal, although the defects are not revealed by the present technique for examination. It naturally follows that the higher the ratio of visibly defective sperms, the greater the prevalence of sterility, abortion and other phenomena associated with the pathology of reproduction. When abortion occurs Bang's bacillus will per-

*N.B.—The Fig. enumeration has been amended to accord with the incomplete series of illustrations in our possession.—Ed., *V.R.*

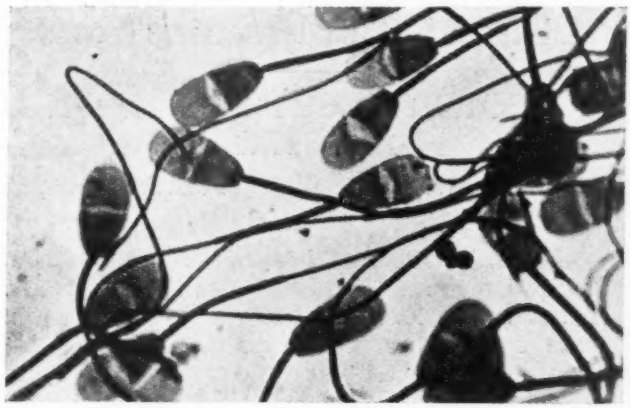

Fig. 1. Healthy spermatozoa from a highly fertile bull. × 900. (Courtesy W. W. Williams and A. Savage). The sperms are uniform in size and form, even in contour, and each portion takes the stain in a distinctive manner.

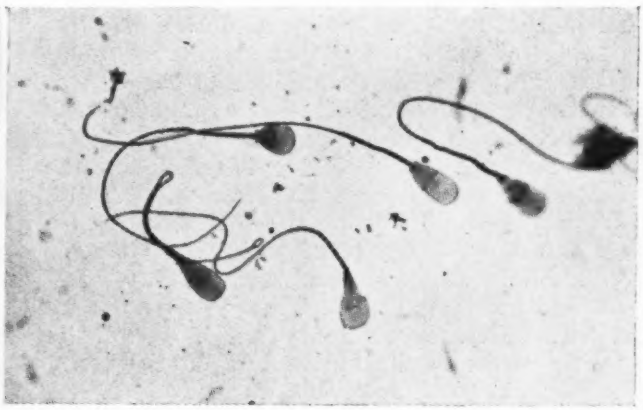

Fig. 2. Spermatozoa from a bull of very low fertility. × 650. (Source same as Fig. 1). No two sperm heads are at all alike in size, shape or affinity for stains. Cows require many services for recognisable conception from such spermatozoa and many pregnancies end in abortion, retained afterbirth, &c.

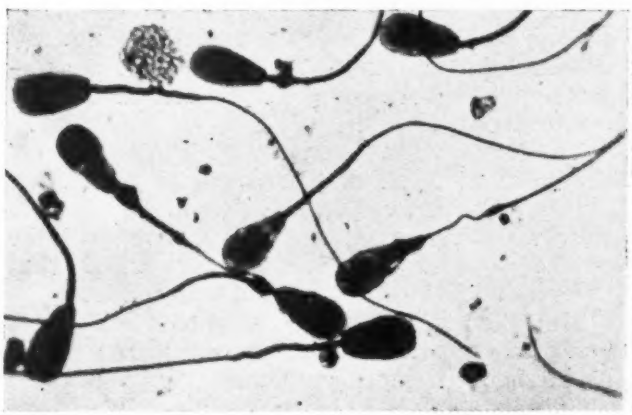

Fig. 3. Spermatozoa from an almost totally sterile bull. × 650. (Courtesy W. W. Williams and A Savage). The sperms are wholly unlike in size and form. All the cell parts take the stain alike so that there is no differentiation of cellular parts. Only rarely can a cow conceive when bred to such a bull. Even then, the conception is generally a calamity, the fœtus dies early and its decomposition so injures the uterus that the breeding life of the cow is closed.

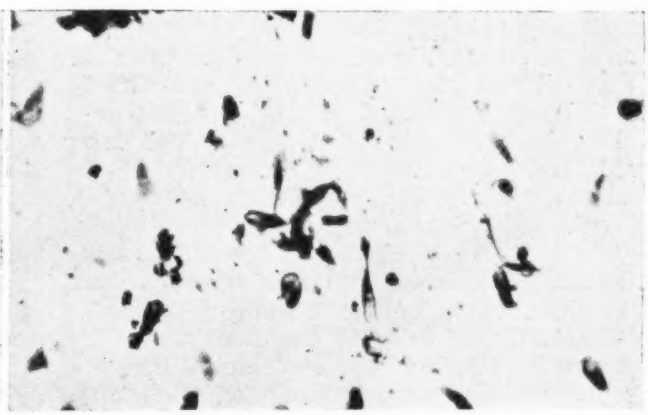

Fig. 4. Spermatozoa from a totally sterile bull. × 650. (Source same as Fig. 3). Compared with Figs. 1 to 3 the spermatozoa are extremely small (Microspermia). The heads are almost wholly without tails, they vary widely in size and contour and each cell takes the stain differently. Such semen is not rare in young bulls when first placed in service, and so far as known they never recover. The cause apparently lies in faulty nutrition during early calfhood. The condition has not been recorded in beef cattle. The available evidence indicates that the condition is analogous to the defective sexual development of heifer calves as discussed in the second lecture and illustrated in Tables I to IV. The only remedy known at present lies in the maintenance of health and vigour in the young calves.

Such extreme cases serve to emphasise the importance of healthy calfhood, because they lead inevitably to the conclusion that every gradation occurs between the hopelessly defective genital system illustrated in Fig. 4 and the typically healthy reproductive apparatus depicted in Fig. 1. Such gradations are constantly met in practice and the fertility of the sire and the vigour of the progeny rises and falls in harmony with the relative health of the spermatozoa.

haps be recognisable, there may be present a spirillum, a streptococcus, a protozoan or the intangible " virus x."

It not infrequently occurs that a young bull when arriving at breeding age, produces only semen like that in Fig. 4. So far as at present determinable, the basic cause lies in the unhealthy condition of the bull as a young calf, and is analogous in nature to the defective development of unhealthy dairy heifer calves. Healthy calves cannot be produced by bulls with spermatozoa like those shown in Figs. 2, 3 and 4, any more than good horses can be produced by mating a mare with a jackass. The barrier cannot be overcome by inoculation with Bang's bacillus, by isolation of the female upon the agglutination test, by the administration of any alleged abortion or sterility remedy, nor even by the previously cited official proclamation of the American Veterinary Medical Association that a sexually diseased bull is a healthy sire. The cause lies deeper and needs be controlled at its source.

The sexual health of males, as determined by the basic test of physiological spermatogenesis is practically ignored. A majority of the states in the union solemnly exclude the importation from another state of a bull whose blood reacts to the agglutination test for Bang's bacillus, but heartily welcome the introduction of bulls with such spermatozoa as those illustrated in Figs. 2 to 4, ostensibly to advance physiological reproduction. Many states, under similar technique and pretence, establish *abortion-free herds* and lead dairymen to infer that if a bull is negative to the agglutination test, he is therefore *sound*, even though his spermatozoa are appallingly pathological. An extreme case which vividly illustrates the inadequacy of the official examination of bulls, bordering upon the ludicrous, recently came under my observation. A quadruped born in Canada was registered in the Holstein herd-book as a bull. It was sold into one of the states which has cultivated extraordinary publicity concerning its wonderful success in controlling contagious abortion. The quadruped was granted entry into the U.S. by the federal bureau of animal industry as a healthy bull, capable of improving the dairy breed, and was accepted with alacrity by the veterinary officials of the proud state. It served no cows and exhibited no observed inclination to do so. Its sexual desire was about on a par with that of a freemartin and other cardinal signs of its being a bull were wanting. Abortion automatically ceased and the herd went dry, although both federal and state authorities had accepted the thing as a valuable addition to the dairy industry. The veterinary profession and the dairy husbandmen keep up such a loud and ceaseless din over *contagious abortion* that nothing can be heard concerning the basic principles of physiological reproduction.

FOREIGN VEGETABLES AND FOOT-AND-MOUTH DISEASE VIRUS TRANSMISSION

Replying to directors of the Highland and Agricultural Society, who asked the Minister of Agriculture to prohibit the importation of vegetables from countries where foot-and-mouth disease exists, Sir John Gilmour agrees that nothing short of prohibition would offer the security desired against the possible introduction of the virus of foot-and-mouth disease through the medium of foreign foodstuffs. He states that if such action were taken on the existing evidence it would be difficult logically to refrain from similar action in the case of imported meat, maize, barley, wool, and hides and skins, the importation of all of which "probably entails greater danger of disease than vegetables."

"I do not think," he continues, "there would be any justification for stopping the importation of these commodities on the available evidence in outbreaks of foot-and-mouth disease. Further, even if there were definite proof that they were the means of introducing the disease on frequent occasions, the public would not, I think, be prepared to acquiesce in their prohibition."

Clinical Communications

ELBOW DISLOCATION IN AN ALSATIAN

H. AWMACK KING, M.R.C.V.S.
Harrow

The subject of the X-ray showing the elbow dislocation is an Alsatian dog of three years of age. He was found at 6.30 one evening, in the owner's garden, having escaped from his enclosure—unable to place the right fore-leg to the ground.

I visited the dog at 10.30 p.m. the same day and found the animal recumbent on his left side, with the right fore-leg held in a state of fixation at an obtuse angle to the body. The owner had bandaged the knee, thinking that the injury was located there.

The dog was immediately removed to my surgery and, under morphia and chloroform, an unsuccessful attempt made at reduction—although the obtuse-angled position of the leg was overcome.

The following morning it was decided to have the joint X-rayed and Major Hamilton Kirk kindly took the two pictures shown. The lateral view was first taken and it was not until the antero-posterior negative was inspected that the extent of the displacement was realised.

Major Kirk obligingly consented to the dog being chloroformed in his consulting room and a further attempt was made at reduction.

Success was not to be so easily attained, however, and as Major Kirk had to hurry urgently away, he kindly got in touch with Professor Wooldridge at the Royal Veterinary College, and to him the negatives, still wet in their frames, were taken along with the subject.

The dog was again chloroformed and after much strenuous manipulation, a successful reduction was effected by Professor Wooldridge, assisted by Mr. Holmes, to both of whom I am greatly indebted for their kind and valuable help.

The dog's leg was bound to the body with knee flexed for four days, after which restraint was removed and except for a little stiffness lasting only a few days the dog is now walking as well as ever.

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STRUCTURAL SPASM OF THE ŒSOPHAGUS

H. AWMACK KING, M.R.C.V.S.
Harrow

The subject of the œsophageal X-ray is a fox terrier dog aged seven years brought to me on account (as the owner expressed it) of the dog frequently wanting to be sick.

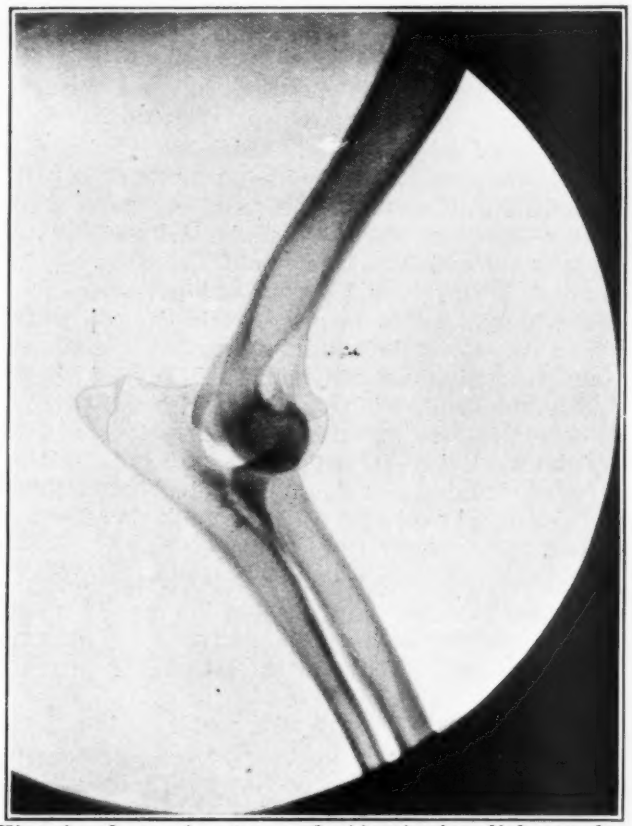

Fig. 1.—Lateral view of Alsatian's dislocated elbow.

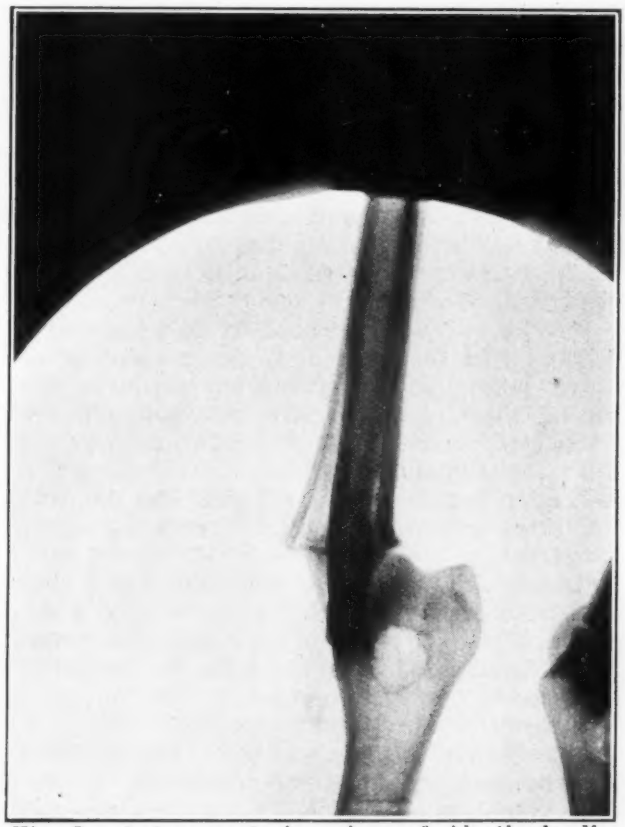

Fig. 2.—Antero-posterior view of Alsatian's dislocated elbow.

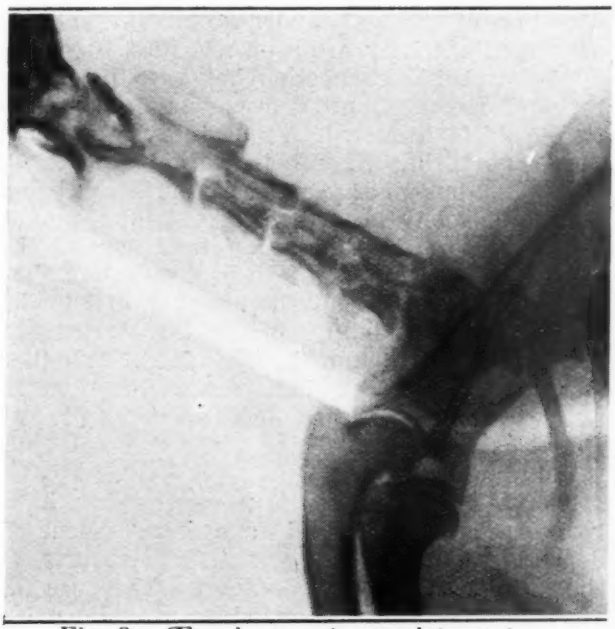

Fig. 3.—Œsophagus at complete rest.

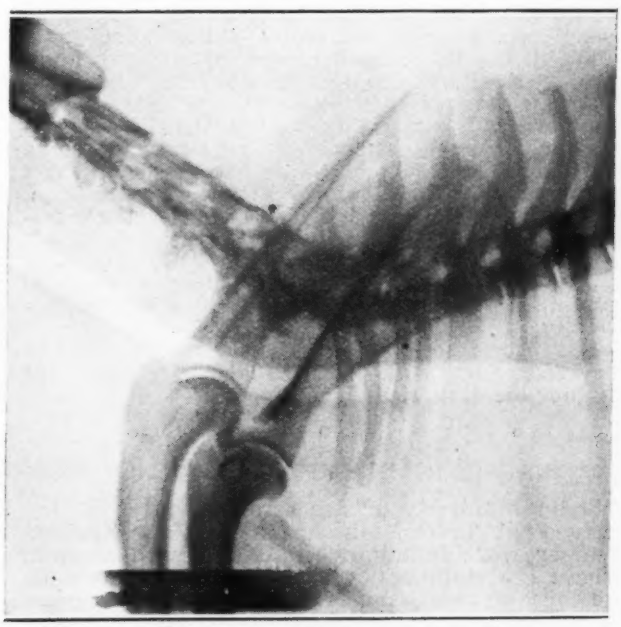

Fig. 4.—Œsophagus during contraction.

Illustrating Cases by Mr. H. Awmack King, M.R.C.V.S.
Radiographs by Major Kirk, M.R.C.V.S.

The dog was taken into hospital for examination and it was found that shortly after food was swallowed cervical contraction occurred as is seen when the œsophagus is obstructed by a foreign body. Manipulation of the œsophagus also produced the cervical contraction.

After a negative result from pharyngeal inspection and passage of the probang, it was thought that an X-ray might be helpful and that possibly some intra-thoracic pressure, if present, might be thereby demonstrable.

Major Hamilton Kirk kindly took the two pictures here shown.

It will be observed that there is a noticeable difference in the outline of the œsophagus as shown before and after the barium meal, but beyond this feature nothing was noted in the radiograph which might be held to account for the symptoms shown.

The deductions drawn are that the dog was suffering from an œsophagitis with spasm of the structure and that such spasm was in existence when the first X-ray was taken: also that the effect of the barium was to overcome the spasm or subdue the cause producing it. The latter deduction is supported by the fact that the dog was very much better for the remaining few days that he stayed in hospital.

Appropriate feeding was recommended, but unfortunately no further information of the dog's condition has reached me since his return home.

ISLE OF WIGHT GUERNSEYS

The Isle of Wight Guernsey Cattle Society are considering a proposal that an Isle of Wight breed of pedigree Guernsey cattle should be founded by the establishment of a herd book similar to that adopted in Guernsey in 1879. Island Guernsey cattle have reached a high standard, as is proved by the fact that large numbers of heifer calves from Island Guernsey cows are bought in Newport Cattle Market each week to improve mainland dairy herds. The milking quality was demonstrated by a report to the meeting by Mr. J. P. Collins, of Niton, that one of his cows had been averaging over six gallons of milk a day, with its third calf. Mr. Collins was instrumental in forming the I.W. Guernsey Cattle Society.

The proposal to form a herd was favourably received and will be further considered at another meeting of the society.

* * * * *

ARSENIC IN IMPORTED MEAT

Some hundreds of carcasses of meat which arrived at Bristol on board a New Zealand steamer were found to be stained with arsenic. Where the stainings were considered dangerous the carcasses were condemned as unfit for human food, but where they were only slight it was found possible to save considerable portions of the meat. The stains originated from drippings from hides, apparently treated with arsenic, which had been stored in the hold above the carcasses.

Abstracts

[Nutritional and Metabolic Disorders in Cattle. Sjollema, B. *Nutrition Abstracts and Reviews.* Vol. i, No. 4. April, 1932. pp. 621-631. 48 refs.]

Diseases of cattle in which metabolic disturbance associated with nutrition is the outstanding feature—such as acetonæmia, milk fever, rickets and osteomalacia, and grass-tetany (of which nature would appear to be the so-called " mystery disease " of bovines reported so widely in this country early in the year) have an unrivalled claim upon the interest of our practising veterinarians. Many of these, therefore, will wish to join with laboratory workers in reading in full this important review of the work done in connection with the application of chemistry to the task of elucidating their etiology and evolving rational methods of treatment.

Acetonæmia, Ketosis or Aceturia. — This disorder is easily diagnosable by the odour of acetone which is its main feature. It usually occurs about a week or ten days after parturition, and produces grave loss in condition and much diminution in the milk yield. It is almost universally accepted that in ketosis metabolism is incomplete, that of carbohydrate being reduced to such a degree that the oxidation of fat cannot be carried beyond the stage of formation of aceto-acetic and *B*-hydroxybutyric acid. With this reduction of the energy evolved from the fatty acids (resulting in increased metabolism of protein) there is hypoglycæmia and a depletion of the carbohydrate stores, and thinness and inactivity are soon manifest.

The probable connection between the occurrence of acetonæmia and pregnancy, or parturition itself, is discussed. A liver intoxication may play a part, that organ being largely concerned in the metabolism of fat, and ketone bodies being mainly or solely formed in it. Consideration is also given to the suggestion that one of the centres of the autonomic nervous system that control metabolism may be affected, and to the existence of an inappropriate Ca : P ratio—a deficiency of calcium in the food. Whether acetone has the same influence on the liver as narcotics and whether aceto-acetic acid and *B*-hydroxybutyric acid are toxic are still outstanding questions.

The various therapeutic measures that have been recommended and are here discussed depend upon the different interpretations of the etiology of the condition. The use of glucose is certainly indicated, to provide carbohydrate for the further combustion of the ketone bodies and to reduce the breakdown of tissue proteins and fats, to accelerate which effect an injection of insulin has been practised with

satisfactory results. Feeding with sugar beet, or other food rich in sugar, is advisable.

. . . . .

Milk Fever, Parturient Paresis.—The researches of the past few years, which have shown the association of milk fever with disturbances in mineral metabolism, have given rise to new theories as to its etiology. Faulty mineral metabolism is evidenced by the low calcium and high magnesium content of the blood serum; furthermore, the inorganic phosphorus of the blood serum is, in nearly all cases, about half the normal. In normal cows the Ca/Mg ratio of the blood-serum is approximately 6, but in milk fever the corresponding figure is 2, a value approaching that found in magnesium narcosis: it is probable that the loss of consciousness and atony of the muscles is related to this.

Does the upset in mineral metabolism follow deficiencies in the food, and is the abnormal composition of the blood the cause of the symptoms? These are urgent questions. It is not at all certain that the very low Ca and P values found in the blood in milk fever originate from similar deficiencies in the food, and other possible factors must be considered. As far as can be judged at present, one must accept the interference of one or more of the autonomic nervous centres as contributing to the faulty metabolism. The result of calcium injection does not prove a lack of calcium in the body of the animal, for mammary inflation produces the same effect. The increased blood calcium level which results in either case will stimulate the autonomic nervous system and the endocrine organs and at the same time cause a readjustment of the concentration of the different ions in the tissues: equilibrium is restored by some unknown mechanism. It is probable that the parathyroids play a part in the onset of, and recovery from, milk fever.

Consideration is given to calcium salt medication, both intravenous and subcutaneous, and to prevention by supplementation of the ration with calcium salts, together with irradiated ergosterol or irradiated yeast during the six weeks preceding parturition.

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Rickets and Osteomalacia.—Two of the etiological factors in rickets are considered in this review, namely, nutrition and ultra-violet light. As far as is known, the vitamin D content and the ratio of calcium to phosphorus are the two factors that determine the value of a diet in the prevention of rickets, though the absolute amounts of Ca and P are also of importance. Marek's explanation of the histological differences between rickets in animals and in children is quoted, *viz.*, that rickets occurs in animals at an age when the skeleton is much more fully developed than in children, but notwithstanding the histological differences it seems well established that dietary factors, such as antirachitic vitamin, calcium, phosphorus and irradiation, play the same rôle in the etiology and cure.

The frequency of rickets and osteomalacia seems to have increased with the intensification of agricultural production, bringing changes in the type of winter ration used for high milk yields and in the manuring of pastures: there is a mineral deficiency in the food caused by a lack of phosphorus or calcium and phosphorus in the soil.

It is almost generally accepted that rickets and osteomalacia differ only because of differences in the stage of development of the skeleton at the time of the onset of the disease; impairment of endochondral ossification typifies the former; halisteresis and osteoporosis the latter.

In these affections differences in the deviations from normal in the content of Ca and P in the blood serum are not regarded as of much importance, but recent research supports the hypothesis that the low level of inorganic phosphorus, which is the main feature of the blood of rachitic children, interferes with calcification. In most cases of rickets in herbivora and pigs, the chief nutritional factor seems to be that the amount of calcium in the ration is small in comparison to that of phosphorus: this is in striking contrast to the low blood phosphorus level generally found in rickets in children; moreover, a similar contrast exists in osteomalacia, the blood in some human cases containing more than the normal amount of calcium.

There is general conformity between rickets of cattle and that of other animals, and its rôle as a predisposant to other diseases is as serious. A further reason for the study of rickets and analogous disturbances in cattle is the experience noted in other animals, that tetany may be readily produced when a rachitic condition exists, *e.g.*, by a sudden and great increase in the phosphate content of the blood.

. . . . .

Grass-tetany.—This brings the author to the subject of grass-tetany, "the sudden increase in the occurrence of which must have some connection with alterations in the methods of feeding and manuring practised by farmers." It is seen principally during the first two weeks after cows are put out to graze. Death often occurs with extraordinary rapidity (sometimes within one hour of the appearance of symptoms) and the mortality is much higher than in acetonæmia and milk fever.

The symptoms are very variable and are subject to change during the course of the attack.

" Usually the initial signs are nervousness, restlessness, grazing apart from the herd, lack of appetite, muscle twitching, unsteady gait, spreading of the hind limbs, gnashing of the teeth, rolling of the eyes, an anxious or wild look resulting from abnormal eye muscle contraction, frothing at the mouth and abundant salivation. Some animals low continuously. The ears stand erect, and certain muscles, *e.g.*, those of the tail, are in tetanic contraction. Abnormal contraction of the neck muscles causes a backward thrust of the head and similar contraction of the masticating muscles results in trismus. Soon after the first symptoms, clonic-tonic convulsions appear and the animal strikes heavily with all four limbs. During these cramps he is in a state of great excitement, and alternately falls down and gets up with a jerk, the attempt to rise being often unsuccessful. The animals also run against walls, into ditches, etc., violent cramps being easily induced." A paretic or comatose state follows, the condition then resembling milk fever, with, however, the following differential features—generally speaking, in grass-tetany the muscles are rigid, the mouth is closed spasmodically, the animal is excited, irritable and has a wild look. The head is carried in a different way in the two conditions.

From the onset there is a throbbing pulsation of the heart, which can be heard at a distance of a yard or more. Fever is absent, though, owing to disturbances in the circulation, the temperature may vary. The disease is not always acute.

There is a disturbance in mineral metabolism which is, as far as calcium and phosphorus are concerned, the same as in the various forms of tetany in the human: a feature not found in the latter, however, is the low magnesium content of the blood serum accompanying a decrease, common to both, in the calcium value. In many cases the Ca/P ratio is low.

The author proceeds to enlarge upon the already-indicated views of the nature of origin of the trouble, which appears to be quite independent of parturition, and also to susceptibility to milk fever, though both diseases occur most frequently in cows with high milk yields. Consideration is given to the factors which bring about a susceptible condition and to the question of the composition of spring grass as a contributory cause.

As grass-tetany is recognised to be a form of tetany, treatment with calcium salts is indicated.

W. B.

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[**On the Cultivation of Tubercle Bacilli** (trans. title.) Plum, N. (1932). *Skand. Vet.-tidskft.* 5. 231-239. 12 refs. Summary in English.]

The author is a departmental director of the Copenhagen Serum Laboratory. He discusses the evolution of methods of cultivating the tubercle bacillus.

The fundamental work of Löwenstein, Sumiyoshis and Hohn is discussed, by which the sowing material was treated with H_2So_4 caustic potash or caustic soda solution and which form the basis of the present methods of cultivation. Petragnani added malachite green to the medium. This was a great advance in that it arrests the growth of other bacteria and favours the development of the tubercle bacillus. A good medium is that of Lubenaus to which is added malachite green (Sickmüller).

Besredka introduced fluid egg medium to which is added malachite green. This medium is the best for cultivating the bovine bacillus. Löwenstein's medium is an egg medium to which is added asparagin and malachite green, and K. A. Jensen has shown that, if the sowing material be homogenised by means of a 4 per cent. caustic soda solution, the cultural characters of the bovine and human type are such that the two types can be recognised on inspection.

If Besredka's and Löwenstein's media be employed for cultivating the tubercle bacilli from material in which these bacilli cannot be detected microscopically, the culture may prove almost as good as the biological test; and this not only as regards proving the presence of bacilli in the original material but also with respect to determination of type. In conclusion, the importance of the addition of tuberculin to the medium is emphasised—a fact first pointed out by Twort and Ingram and later confirmed by Holth.

G. B. B.

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[**The Distribution of Infectious Bovine Abortion. *B. abortus* (Bang) in Finland** (trans. title). Stenius, R. (1932). *Skand. Vet-tidskft.* 5. 254-256. 1 map. Summary in English.]

The author contributes a short article, illustrated with a map, on the legislative measures in connection with, and the distribution of bovine abortion in Finland in January, 1932. From the map it is seen that the disease is most common in the more highly populated areas as around Helsingfors and the Baltic ports of the north-west coast.

When infectious abortion is found to be present in a herd not only this herd but the entire communal district in which the herd is situated is declared to be infected. The districts involved on January 1st, 1932, are shown on the map; 2,204 herds and 282 districts had been declared infected at the end of 1931.

The majority of North Finland, parts of Middle Finland and Karelen and the whole of the Aland archipelago are free from the disease.

G. B. B.

Reports

Annual Report for the County of Lanark and the Burghs of Biggar and Lanark for the Year 1931

We are in receipt of the sixth Annual Report by Mr. Hugh Begg on the work done by the Veterinary Department of the County of Lanark under the Milk and Dairies (Scotland) Act, 1914, for the year 1931.

Anthrax.—Twenty-one deaths occurred from anthrax, all in bovines, in 20 outbreaks and it is satisfactory to note that no case of human infection occurred. Mr. Begg refers to his report on the incidence of this disease for the last 21 years, which was recently reviewed in our columns.

General—We are told that not more than 4 per cent. of the dairy farms in the county produce butter or cheese as a regular procedure —a great reduction compared with that existing before the war.

As the result of bulk sampling of milk, 10 reports of tuberculous milk were received from Glasgow and a like number from Edinburgh. Investigation of these elicited 14 cows with tuberculosis of the udder, one with chronic cough and definite clinical signs of the disease and six said to have been giving tuberculous milk. In five instances no tuberculous cows could be detected. Considerable difficulty was experienced from the inoculated guinea-pigs dying prematurely, which necessitated many samples having to be repeated. Two of these investigations call for special mention. In one case the herd from which the original sample complained of was taken consisted of seven cows and was self-contained. Although no clinical evidence of disease could be detected individual milk samples were taken from each of the seven cows and all proved negative to microscopic examination. Inoculation of guinea-pigs resulted in no less than five being reported as tuberculous. Despite the absence of any clinical signs of disease the five cows were all slaughtered under the Tuberculosis Order. In three no evidence of tuberculosis could be detected after the most exhaustive *post-mortem* examination and in two, only minute lesions were found, but none in the udder substance, which even proved negative on microscopic examination at the laboratory. Mr. Begg informs us that each cow had distinct lesions of Johne's disease, but does not say if this was confirmed by the finding of the bacilli. Such a result as this is most unusual and disconcerting and Mr. Begg rightly calls attention to the need for further research into the possibility of a transmutation of members of this allied group of organisms. In the second case referred to, the examination of the herd revealed two cows with tuberculosis of the udder, which were immediately dealt with and group samples were taken from the other cows. Three of these samples were reported within 24 hours as containing acid-alcohol-fast bacilli. On individual samples being taken from each cow in each group, three were found to contain acid-alcohol-fast bacilli. On the cows in question being slaughtered two were found to be affected, but were "not advanced" and no evidence of tuberculosis could be found in their udders. The third carcass was free from any lesion. Mr. Begg remarks that when "acid-alcohol-fast bacilli . . . are found in a properly-taken sample they are invariably regarded as tubercle bacilli." In our experience acid-alcohol-fast bacilli, other than and different in appearance from tubercle bacilli, may occur in milk even collected under careful conditions and sight should not be lost of this fact.

Veterinary Inspection of Cows.—This is the first year that three complete inspections have been carried out and the results appear fully to justify the change from a single one. Two additional whole-time temporary veterinary assistants were appointed for this work. It is rather surprising to learn that routine inspection of dairy cows during the grazing season is regarded as more or less impracticable and uneconomical in Lanarkshire, as in certain other counties it has been found to be possible with but little difficulty once the farmers have become used to it. During the year 4,572 visits were paid to farms and 92,819 examinations of cows were carried out. It is calculated that this involved the examination of about 38,000 individual dairy cows of which 0·42 per cent. were found to be giving tuberculous milk. Visits were also paid to herds on premises which are not registered dairies but from which milk is sold in small quantities and all cows thereon examined. In one case where the milk of four cows owned by a shepherd was being used by a young family and for calf rearing no less than three were found to have tuberculosis of the udder.

The Tuberculosis Order.—As the result of the increased inspections 132 cows with tuberculosis of the udder were slaughtered and of these 104 were detected by the veterinary staff against 64 and 47 respectively in the previous year. Ten cows were slaughtered as "giving tuberculous milk," 39 with tuberculous emaciation and 242 having a chronic cough and showing definite clinical signs of tuberculosis. Of these two last categories 13 and 118 respectively were detected on herd inspection. An interesting table is inserted showing the occurrence of tuberculosis in the different quarters and combination of quarters of the affected udders.

There are 15 "Certified" herds, 30 "Grade A

(Tuberculin Tested)" and five "Grade A" herds in the county. This shows an increase of one "Certified" and five "Grade A (Tuberculin Tested)" herds during the year. Out of the 45 tubercle-free herds no less than 28 became eligible to be tested only once annually, showing that these have had no reactors in two consecutive tests.

The report shows the continued progress made by this, the pioneer county to go in for a whole-time veterinary service, and concludes with a map of the county giving the number of tuberculosis cases dealt with under the Tuberculosis Order in the different parishes.

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SOUTHERN RHODESIA

REPORT OF THE CHIEF VETERINARY SURGEON FOR THE YEAR 1931

The Report of the Chief Veterinary Surgeon of Southern Rhodesia, Major J. M. Sinclair, for the year 1931, makes interesting and instructive reading. It is a record of work ably performed and emphasises the all-importance of an efficient veterinary service in those parts of the Empire which largely depend upon the progress of their pastoral industries. During the period under review Southern Rhodesia suffered a serious disaster by the unexpected appearance of foot-and-mouth disease, the source of origin of which remains a mystery. The drastic restrictions necessary for its control resulted in the almost complete paralysis of the cattle industry of the country.

Notwithstanding the regulations already in force for the control of East Coast fever, which permitted the movement of cattle only under official permit, foot-and-mouth disease had already been widely disseminated before its presence was even suspected, and the Veterinary Officers in charge of enormous areas were confronted with a truly appalling task. The manner in which they dealt with the situation is described in extracts from their reports which also contain valuable information concerning the somewhat unusual manifestations of the disease. It would appear that at the commencement it presented the usual classical symptoms and caused some mortality, but later it became very mild and scarcely recognisable, with a mortality probably not more than one in 10,000. It was not readily transmitted and apparently close contact between sick and susceptible cattle was necessary. The Chief Veterinary Surgeon states: "It soon become apparent that under local conditions the infection of foot-and-mouth disease was not so readily disseminated as in most other countries. The possibility of infection being carried by indirect means cannot be denied, but under local conditions it is a negligible factor. Were it otherwise it is doubtful if any part of the Colony would escape. Game and other wild animals, even those which contract the disease, do not appear to be responsible for the spread of infection. These conditions are no doubt due to the low infectivity of the virus, the result of rapid attenuation or inactivation by our climatic conditions." D. V. S. Myhill states: "Every spread of infection can be traced to direct contact with infected cattle, and in no instance has suspicion pointed to any other means, such as equines, mechanical transport, humans, game, wild animals, drinking water or foodstuffs." A few cases of infection were observed in pigs, the result of feeding on milk from an infected herd of cattle. One flock of sheep is said to have been infected, but the diagnosis was not certain.

In discussing methods of control the Chief Veterinary Surgeon writes: "The very slow progress of the disease in many areas was really unsatisfactory, because the longer it took to pass through the herds the greater the danger to adjoining clean centres. It was felt that some method of transmitting the disease to all cattle in areas which could not hope to escape infection would assist materially by shortening the period of infection, and by establishing a belt of immune cattle between infected and clean country. To achieve this two of the methods suggested by the Director of Veterinary Research, *viz.*, direct contact and the injection of infected blood up the nostrils, were adopted during December and so far the results have been satisfactory. The clean herds to be infected are as far as possible concentrated within the infected area and after recovery are permitted to return to the usual grazing grounds."

Apart from foot-and-mouth disease, the Colony appears to be remarkably free from disease. Glanders is conspicuous by its absence and only one case of tuberculosis was recorded. Heartwater, however, caused some mortality and it is recorded that the vector of infection, the bont tick (*A. hebræum*), is gradually extending its habitat. Cutaneous myiasis of cattle caused a great deal of damage, and the existence of snotziekte was demonstrated by the Director of Veterinary Research. Losses from redwater and gallsickness were heavier than usual in areas where dipping was suspended on account of foot-and-mouth disease. In attached schedules it is shown that there are approximately two-and-a-half million cattle in the country and 3,234 dipping tanks.

The Chief Veterinary Surgeon expresses his appreciation of the services rendered by all members of his staff, and in view of the arduous work willingly performed by them his commendation appears to have been well deserved.

R.C.V.S. ANNUAL DINNER

Speech by H.R.H. the Duke of Gloucester

Conferment of Hon. Associateship

For the first time in the long and notable history of the Royal College of Veterinary Surgeons, the Annual Dinner (which was held at the Hotel Victoria, London, on June 30th, 1932) was honoured by the presence of a member of the Royal House. Not only by his attendance, but by his particularly gracious act in proposing the principal toast, H.R.H. the Duke of Gloucester gave further gratifying expression to that family interest in the well-being of the profession so generously exemplified by His Majesty the previous week in connection with the Royal Veterinary College Rebuilding Fund.

The size and character of the function in every way befitted so memorable an occasion, and the President of the College—Mr. G. Percy Male—was subsequently the recipient of many congratulations upon so outstandingly successful a social feature of his year of office.

Prior to his joining the assembled company, the Duke was presented by the President, in an ante-chamber, with the diploma of Hon. Associate of the Royal College of Veterinary Surgeons—an honour to which His Royal Highness hastened to make appreciative reference in his after-dinner speech.

The President was supported by well over a hundred Fellows and Members of the Royal College, and the following were included in the large company of guests:—H.R.H. the Duke of Gloucester, Earl De La Warr, Lord Dorchester, Lord Askwith, Lord Richard Cavendish, Alderman Sir Phéne Neal, Bt., Sir Merrik Burrell, Bt., J. F. Elias, Esq., Captain C. Hilton Green, Professor W. W. Jameson, Dr. A. B. Howitt, M.P., Colonel P. J. Simpson, Sir Edward Stern, Sir Arthur Erskine, Brigadier-General J. H. V. Crowe, Colonel F. C. Lowis, Major E. H. Riches, Professor J. A. Gardner, Dr. Irwin Moore, Captain Towler, Mr. Surrey Dane, Mr. Colin Smith (Deputy Clerk, Privy Council) and Mr. Machtig (Assistant Secretary, Dominions Office).

The Loyal Toasts were duly honoured on the call of the President who, amid fervent assent, expressed the sincere hope that the indisposition from which it was that day announced that H.R.H. the Prince of Wales was suffering would soon be relieved.

The Duke of Gloucester's Speech

In proposing the toast of "The Royal College of Veterinary Surgeons," H.R.H. The Duke of Gloucester, K.G., G.C.V.O., LL.D., Hon. Associate R.C.V.S., said:—

In the first place, I want to thank you for the welcome you have given me to-night, and to say—as I am very glad to be able to do—that my elder brother is very much better now. (Cheers.) I also desire to express my deep appreciation of the honour which was conferred upon me before dinner, when I was presented with the diploma of Honorary Associate of the Royal College of Veterinary Surgeons. I thank you most sincerely for the compliment you have paid me.

It is with great pleasure that I rise to propose the toast of the College, as there is no institution which does more important if rather unobtrusive work. In fact, your work, if I may be allowed to say so, is much too unobtrusive and suffers from lack of advertisement, and in consequence from a lack of funds which has been a handicap for some time.

Although some of the daily papers are now asking for subscriptions to be sent to you so that you can rebuild your Veterinary College in London, which is in a dilapidated condition, I feel that I should like to see the front page of a daily paper devoted entirely to the achievements and hopes of the veterinary profession.

There is no doubt that a great many people imagine that the "do all and end all" of veterinary science is to provide a broken-down racehorse with a new leg or to extend the life of a pet dog beyond its allotted span—both, it is true, very admirable objects and no one realises it more than myself, who love both horses and dogs. (Hear, hear.)

It is a tragedy to know that the spirit of one's best horse is as willing as ever but that the leg is really very weak. An apple a day may or may not keep a doctor away, but definitely a carrot a day does not keep a veterinarian from the stable. (Laughter.)

Horses and dogs are our companions to such a great extent that they should, we feel, be treated like humans. The only difference, I admit a big one, is that a human can say how he feels and where the pain is. A dog very nearly can, but not quite, and we therefore require a very high standard of science to overcome this difficulty.

I really believe that even in these enlightened days comparatively few people realise to what an extent our national enterprises depend upon the skill and devotion of our veterinary surgeons, quite apart from the humanitarian point of view, which is obvious.

Let us take a few cases at random. Tuberculosis in cattle is a disease which has threatened producer and consumer alike with disaster, but now, thanks to the activities and researches of veterinary science, the matter is well in hand, dairy farmers are enabled to make a living, and the health of the nation is no longer endangered.

Foot-and-mouth disease has been attacked by veterinary science. Even if a remedy is yet to be found, the hard work of the veterinary

surgeons in diagnosing the disease has been of the greatest service.

Distemper was till recently a very serious threat to our national sports—hunting and shooting: a master of hounds had to send about 50 couple of puppies to walk if he wanted to get an entry of ten couples. Quite apart from the extra expense involved, it was always the best that died. The same thing happens to gun-dogs. Apart from sporting dogs, anyone with an humanitarian mind must welcome any measure that will obviate and alleviate this scourge. A human being with bad influenza is a pitiable sight: a puppy with bad distemper is far worse. Endless and careful research work has, we firmly believe, got the better of this disease and with further advance of veterinary science it may become a thing of the past. (Hear, hear.)

In connection with tropical diseases, there is a special diploma for Tropical Veterinary Medicine and the Colonial Office grant veterinary scholarships. The practical use of this is that many of our colonies depend for their existence upon the welfare of horses and other beasts of burden far more so than we do here, where there is a train or motor road wherever you want to go or take your produce, and these countries need the best brains we can produce, trained in the best veterinary methods, to cope with obscure animal diseases which may occur in such places.

My last example of the varied claims on veterinary science is war. During the last war two-and-a-half million animals were admitted to our veterinary hospitals for various causes and of this number 78 per cent. were returned to duty cured. This is a striking example of veterinary efficiency and a record which I feel sure was not equalled by any other combatant nation. (Cheers.)

Although at the moment I command a squadron of armoured cars, I am fully convinced that animals are by no means finished with as a necessary part of an army. (Hear, hear.) I hope all of you have read the very excellent brochure which Major-General Sir John Moore—(cheers)—published about a year ago dealing with this particular branch of veterinary achievements. It was published to assist in raising funds for the rebuilding of the Royal Veterinary College in London, and I hope that the necessary sum will be forthcoming.

Mention here of this College leads me to say a few words on the organisation of the veterinary profession in this country. I will be brief, as it is doubtless known to all here, but the general public are perhaps unaware that there is only one portal of entry to the veterinary profession, namely, the qualifying examinations held by the Royal College. Students are prepared for this examination at one of five colleges of which the one in London is the oldest, and anyone who has not qualified at one of these colleges is not entitled to call himself a veterinary surgeon, and the public make use of his services at a grave risk.

Needless to say, the R.C.V.S. has made it a chief duty to keep the examinations up to a high standard and to select the examiners from men of the highest repute in the profession, with the object of providing the country with a body of veterinary surgeons adequate in number and with first-class scientific knowledge and professional ability. (Hear, hear.)

The highest office to which any member of the profession can aspire is that of President of the Royal College. He is elected annually by the Council, and I have the pleasure of coupling with this toast the name of the present holder of the office, Mr. G. P. Male. (Cheers.) His professional activities, numerous though they are and have been, have allowed him time to take a great interest in sport. He is Master of the South Oxfordshire Drag Hounds and is knowledgable in livestock of all kinds. He has shown that he appreciates both the humanitarian and utilitarian sides of the profession by his scheme for the free veterinary treatment of animals of poor people and by a special effort to eradicate bovine tuberculosis from the herds of this country.

I give you the toast of the Royal College of Veterinary Surgeons, coupled with the name of our President. (Loud and prolonged applause.)

The President of the Royal College of Veterinary Surgeons, G. P. Male, Esq., M.R.C.V.S., replying to the enthusiastically-honoured toast, said:—

It is a great honour and a privilege to reply to the toast which has been proposed in such generous terms by the Duke of Gloucester and received with so much enthusiasm by our guests and members of the Royal College. I must confess, however, that I would rather follow the Duke of Gloucester over the fences in our Berkshire country than try to compete with him on this very hot evening in June (Laughter.) I have had some experience of the former and I might tell you, if he will allow me, that in the words of Whyte Melville, he is "a good man to follow; a bad one to beat." (Hear, hear.) I know, however, that you would wish me, as President, to thank him most sincerely for honouring us with his presence here this evening. (Cheers.) Ours is a small profession, numbering about 3,400 members, and they are scattered over this far-flung Empire. Some, perhaps, are at this moment making serum away in the hills at Muktesar; others may be doing their work in the wilds of Nigeria; others, like myself, belong to that band "whose sore work does not divide the Sunday from the week."

Yet all will appreciate the fact that, for the first time, a member of the Royal Family has graced our banquet—(loud cheers)—and his words will give encouragement to all of us, and especially those who, owing to agricultural depression and other causes, are having a very bad time just now. Our work is tending to become more specialised, and I foresee in the not-distant future, that some State subsidy or a panel system similar to that in operation among the human population will have to be devised if a sufficient number of veterinary surgeons are to remain in agricultural districts.

This year will perhaps be remarkable in the history of the Royal College in that during it an Act has been passed and a Supplemental Charter granted—both in one year. The Act is the Irish Free State (Agreement) Act, and I am very pleased that now the regulations governing the Members practising in Ireland have been put on a proper footing. We are very glad to welcome to our Council those elected to represent the Irish Free State: this will strengthen our hands and, we hope, theirs also. I should like to say how delighted we are to see some of our recently-elected Irish brethren amongst us this evening. (Cheers.)

This year is also particularly memorable as one in which the curriculum of four years was superseded by one of five years. This was rendered necessary by the vast increase in knowledge of diseases and in the number of the domesticated animals which now have to be studied intensively. In the old days the horse was paramount, now the anatomy, the physiology and the pathology of the cow, the sheep, the pig and, indeed, poultry—and not forgetting our friend the dog—must be studied with at least equal diligence.

His Royal Highness, as he has told you, has been graciously pleased to accept the Honorary Associateship of the Royal College. (Loud cheers.) I know that will meet with the cordial approval not only of those Members present but of the whole of the veterinary profession. (Hear, hear.) We have not many honours to distribute, unfortunately — or to receive —(laughter), but this is the highest honour we have and we are very delighted to add his name to that of his Royal Brother, the Prince of Wales. (Cheers.) I will hasten to reassure him that it does not entail any great obligations: the worst that could happen is that he might be called out in the middle of the night to attend a horse with colic or something of that sort—though from my knowledge of his skill with horses I am quite sure he would acquit himself with distinction. (Laughter and applause.)

If this country is to produce only a tithe of the animal foods and food products required for our people then there must be an enormous increase in our animal and poultry population and improvements in our system of production and marketing. With more intensive cultivation so will there be a tendency to the increase of disease and it will require all the skill and the care of the veterinary profession to keep this animal population in good health. In anticipation of this we have increased our curriculum and course of study and we hope this will be appreciated by agriculturists and stock owners.

I am afraid, sometimes, that the standard of veterinary education is measured by some of the buildings in which the teaching is given, as the wife of a M.F.H., otherwise very knowledgable, remarked to me: "I suppose you people do go to some sort of place and have a kind of training." (Laughter.) On the other hand, I have heard it said that it is easier for a camel to go through the eye of a needle than for a man to enter the portal of the Royal College of Veterinary Surgeons. We have only one portal and it is a long and narrow path, whereas other professions I believe have many portals and the path is broad and lined with gold. (Laughter.)

We hope that through the efforts of our good friend Mr. Elias—whom we are very pleased to welcome here to-night (cheers)—and his group of papers, the last £25,000 will be forthcoming to enable us to obtain the grant from the Government to rebuild the London College.

I do not wish to detain you, but there is just one more point, if you will allow me, and that is on the question of research. Although there may be a great difficulty in deciding how best to benefit agriculture there should be no hesitation in one direction and that is in providing for research into animal diseases. (Hear, hear.) Which disease is causing the most economic loss to breeders is a matter of opinion; some may think contagious abortion; I have tried to show that tuberculosis is very expensive to the country and may mean an annual loss to the community of anything up to £10,000,000. Others may think Johne's disease the gravest source of loss, but whatever money is spent on investigating these and other diseases I am quite sure will be repaid a hundred-fold. Sir Merrik Burrell will no doubt tell us that there are many diseases which the veterinarian is ready and most anxious to investigate in which work is being held up by want of the necessary funds. I sincerely trust that in the near future these will be forthcoming and that, as a result of the deliberations of the Animal Diseases Committee of the Agricultural Research Council—which is presided over so ably by Sir Merrik Burrell—veterinary science will arrive at its reward and that research will not be starved in this country. (Hear, hear.)

I will therefore conclude by again thanking

your Royal Highness for so kindly proposing the toast of the Royal College and you, gentlemen, for the cordial way you have received it. (Loud cheers.)

"Hunting"

This toast—a new and most appropriate feature of the Royal College Dinner speech programme—was proposed by the Rt. Hon. Lord Dorchester, O.B.E., J.P., who, in the course of his remarks, described the toast as embracing every form of the peerless sport of hunting—stag, fox, otter, hare and drag.

In an assembly like the present, he assumed that most of them had read their Jorrocks—any who had not done so should hasten to remedy that dire omission from their education—(hear, hear)—and he had always considered it something of a flaw in an otherwise noble character that to Jorrocks hunting meant fox hunting and fox hunting only. He shared with Jorrocks his enthusiasm for fox hunting; at the same time, he did not know whether he did not like other forms of the pursuit just as well: he always said that, whatever its form, hunting was the best sport in the world. (Cheers.)

There was an old saying that "trade follows the flag": he would like to amend that saying so that it might read "horses and hounds follow the flag and trade," as far as the Anglo-Saxon race was concerned. He had followed hounds in a great many different parts of the world; some packs were recognised and registered, others were of the scratch order, but they had never failed to show good sport. He had hunted an amazing variety of animals and once had an extraordinarily good hunt with a weasel. (Laughter.) What struck him so particularly about those packs was that the local inhabitants were so fond of them: it made him think what a wonderful bond to cement friendship was hunting. (Hear, hear.) That led him into high politics and he began to think about Geneva. (Laughter.) He thought, supposing the League of Nations were to start a pack of hounds? (Laughter and cheers.) Of course, they had not got the money at present: they might reduce their secretariat, their loans to Liberia, the number of their more beautiful lady typists even—(laughter)—and devote the money so saved to founding at Geneva a free-for-all-nations pack of hounds. (Hear, hear.)

He was sure that the good feeling thereby engendered would do a great deal to palliate the war-like instincts in the world. (Hear, hear.)

He had taken that opportunity—the first he had had, and perhaps the last ("No, No.")—to meet the Royal College of Veterinary Surgeons *en masse*, and he desired to enlist their sympathy and good offices in a matter he had much at heart. He believed that the weight of their opinion would do more than anything else to remove what he considered rather a discredit to fox-hunting, and that was the cruel practice of rounding the ears of foxhounds, which he deemed to be both stupid and unnecessary. A hundred years ago the ears of hunters and thoroughbreds used to be cropped in this country: that practice was good a hundred years ago, but it was of no use now.

Lord Dorchester had much pleasure in coupling that toast with the name of Captain Hilton Green, to whose sportsmanship he paid high tribute, and whom he described as having achieved the zenith of a huntsman's career—the Mastership of the Cottesmore Hounds.

Captain Hilton Green, M.F.H., in response, expressed his appreciation of the proposer's kindly reference to him. He entirely agreed with Lord Dorchester that to round the ears of fox-hounds was unnecessary, and he gave it up some time ago, but he could not agree that it was in any way cruel, because he knew many of his own master-of-hound friends who pursued the practice and was confident that they would not do it if it were cruel.

He thanked the Royal College of Veterinary Surgeons very much indeed for so kindly inviting him to their dinner and for the honour they had done him in joining his name with that toast, as an old supporter of hunting, but he could not help thinking that their President, in putting him down to reply to it, had fallen into the usual error of thinking that masters of hounds had a fine flow of language. (Laughter.)

That toast was supposed to cover all forms of hunting: that was rather a wide field—fox, stag, hare, and drag, down to treasure hunting and now he believed there were even going to be scavenging hunts for ladies. (Laughter.) Hunting was the noblest sport of all: it was the most typical of England, while the employment that it afforded and the money that it circulated were well known—there was no country district that was unaffected by it, and it brought not only some measure of prosperity, but colour, life and enjoyment to the inhabitants of the English countryside. (Hear, hear.) Together with the rest of the world, hunting was going through a difficult time; it would survive it, just as the rest of the world would come out on top. (Cheers.)

He felt that the only right he had to respond to that toast—it was a very small one and probably all of them possessed it, too—was that he had hunted with every form of hound, though in his case there was one exception, which he thought was rather a bad omission: he had never been out in his life with a pack of drag hounds. He intended, however, to repair that omission.

He should like to say how greatly the hunting community appreciated the work of the veterinary surgeon and how much he did for them, but he thanked the members of the profession most of all for the gallant fight they were putting up against that abominable disease, distemper. The fight was not yet won and, if they would bear with him, he would tell them of his own experience in inoculating against distemper. He first inoculated his hounds in 1929, and these animals were later put into the same kennels with young hounds which had not been inoculated. Shortly afterwards distemper broke out, and in spite of the fact that it was a very virulent form, and though they lost many of the uninoculated hounds, not one of the inoculated hounds even went off his food. That was in 1929. In 1930 and 1931 he again inoculated the hounds, with equally successful results, though in those two years they were not exposed to infection. In those years the hounds were inoculated with vaccine and ten days later with virus. This year they were inoculated on the same day with serum and virus, and the results, it appeared, had not been quite so good. Out of 50 hounds inoculated six went down badly with distemper and one died. Thirteen never had distemper at all, and 31 for four days went a little of their food, had dry noses and a husky cough, but after that were perfectly normal. In his case, therefore, the inoculation against distemper had been a pronounced success. (Hear, hear.)

He would say, in conclusion, that he thought there were no people in the wide world who were more fond of animals than were masters of fox-hounds and veterinary surgeons. (Cheers.)

"Our Guests"

Professor G. H. Wooldridge, F.R.C.S., M.R.I.A., F.Z.S., in submitting the above toast, spoke of his duty in doing so as being a very pleasant one, because he knew that he had the company so whole-heartedly with him. (Cheers.) For the purposes of the toast he included His Royal Highness The Duke of Gloucester as a member of the profession, as he now was from that day. Generally speaking, veterinary surgeons were the arch-altruists amongst professional men. As a rule they thought less of themselves than of anyone else; so much so, that their main duty in life was to exterminate animal diseases of all kinds and, in so doing, what was to become of the veterinary profession? (Laughter.) That night, however, they were reversing the order of things, in that they were inviting their guests in order that they might have the privilege and enjoyment of their company. (Hear, hear.) He did not know whether their guests had looked at it in that light, but it was indeed a fact that, rather than the Royal College giving pleasure to the guests, it was the latter who were conferring benefit and encouragement upon their hosts by reason of their much-appreciated presence there that evening. (Cheers.)

They had among their guests that night very notable instances of goodwill towards their profession as a whole: in some instances, perhaps, their guests had come as representatives of some institution the interests of which were allied to those of the profession, but he was perfectly certain that the presence of such a guest was not primarily dictated by any such institutional association, but by personal regard for the profession as a whole and for the work it had to do. (Hear, hear.) In that respect he might mention Sir Edward Stern, who had contributed very largely indeed to the funds with which they hoped to rebuild the Royal Veterinary College; also, he might he thought be excused if he mentioned Mr. Lethbridge, through whose instrumentality largely the College was able to receive that very handsome cheque for £20,000 through the Tail Waggers' Club. (Cheers.) Mr. Elias had been mentioned, and he thought they should include in that toast two colleagues of that gentleman—Capt. Towler and Mr. Surrey Dane—who were working very hard to gather funds from some of the leading papers in the land. (Hear, hear.) Mr. Nethercoat, too, had been instrumental in helping veterinary education in a very remarkable way by assisting to provide resources for the College. Those very kind acts were indeed a reflection of their general attitude with regard to the profession as a whole and therefore to the Royal College of Veterinary Surgeons. (Cheers.)

They had also with them other guests who had assisted in a very great way from time to time in promoting the interests of the profession—for example, Sir Merrik Burrell. (Cheers.) He did not know that any of them could quite realise the enormous amount of work that Sir Merrik had put in, and was still putting in, on behalf of the profession as a whole: may be he was, in some respects, from the Royal Veterinary College, but it was equally certain that he was there to show his admiration for the work they were doing. Sir Merrik was Chairman of the Animal Diseases Committee of the Agricultural Research Council, and in that sphere he would be able to make a great impression on the work to be carried forward by their profession.

He also wanted to couple with that toast the name of Earl de la Warr who, he was sorry to say, had been called away. Earl de la Warr had always shown great interest in them, as had Lord Askwith, who had shown his admiration through the interest he had recently taken in their affairs—perhaps more in regard to

greyhound racing. He (Professor Wooldridge) must admit that that sport in itself had given a great impetus to the veterinary profession, when some of the other doors had been closed.

He asked them to rise and drink the health of their guests, coupling with the toast the names of Sir Merrik Burrell and Lord Askwith. (Cheers.)

Sir Merrik Burrell, who was the first of the guests to reply, first expressed the pleasure it afforded him to be allowed to respond to that toast. That night he had enjoyed himself right through the evening. They had had most excellent hospitality and more than excellent speeches, and he was sure that they had felt particularly grateful that night for the opportunity of singing " God Save the King," because quite recently His Majesty was kind enough to send a second most generous contribution to the rebuilding fund of the Royal Veterinary College. At the same time he commanded that a most gracious letter should go with it, and that night they had exemplified to them the fact that the kindly interest which His Majesty had always taken was hereditary. (Cheers.) Moreover, if he might be allowed to say so, another thing that was also hereditary was His Majesty's gift of oratory. (Hear, hear.)

Lord de la Warr had asked him to apologise for his absence—he was exceedingly sorry not to be able to share the pleasure he (Sir Merrik) had in returning thanks for their kind hospitality that night.

He should like to mention to them that their President was one of his right-hand men on the committee which ran the Pathological Institute at Camden Town. Mr. Male found time in a very busy life to come up and help them in their work, and he hoped they might have his assistance, his help and his advice for many years to come. (Hear, hear.)

He noticed that he was asked there that night in his capacity as Chairman of the Animal Diseases Committee of the Agricultural Research Council, and he offered no apology for striking what must be a sad note. Only quite recently his Committee and their profession had suffered the loss of a very great man—Mr. Eustace Montgomery. When the Agricultural Research Council had formed its Animal Diseases Committee they had to look round for technical advisers in the same way as every one of their committees had to do; they chose Sir John Moore and Mr. Montgomery, and he could not say how deeply they deplored Mr. Montgomery's loss. In the short time that gentleman had been able to work for them they had ample evidence of the height of his scientific knowledge, of the width of his great experience and administrative ability and the depth of his common sense; to those attributes there was added that perhaps less tangible yet even more valuable asset, a most charming personality. (Hear, hear.)

The Agricultural Research Council had not been in existence very long, and they had had to make a complete survey of the whole field of agricultural research, including veterinary research— and it was an enormous field. That Council had met very few times before it definitely made up its mind that veterinary education and research—which definitely must go together—were without doubt the most important problem that they had to tackle, and other problems of agricultural research had been deliberately pushed on one side in order that the energies of the Council should be concentrated chiefly on solving the many problems of veterinary education and research.

One of the obvious difficulties of their work was that it would be perfectly useless—and to his mind it would be wrong—to go to the Treasury at the present time for more money. They had therefore to make a complete survey of the whole field, in order to see where they could save wisely that they might wisely spend. Only as lately as the previous day his committee had signed an interim report on one portion of veterinary research, and if that report passed the Agricultural Research Council and then met with the approval of the Committee of the Privy Council concerned, he thought, if it were acted upon, that there would be one important research institute in this country which would be glad of the Agricultural Research Council's report. (Cheers.)

One of the things which had struck the Agricultural Research Council was the enormous advance in veterinary science that had taken place in the last hundred years, in spite of the enormous difficulties that their profession had had to face. Only the other day they had a conference, at which their President was present, when a great scientist of world-wide repute, commented to him that it had been a most useful conference, and that he was amazed at the high quality of the discussion. He (Sir Merrik) said that that might be so, but that there was no reason for him to be astonished—there were just as good men in the veterinary profession as there were in any of the others. (Hear, hear.) That just showed the rather slow recognition of the importance of the veterinary profession among other scientific professions, and he would like, if he might, to emphasise what His Royal Highness had said about the need of publicity. It could not be too widely known that a really sound, efficient veterinary service was of the greatest importance to the whole Empire. (Cheers.)

He desired to thank Professor Wooldridge for the kind things he had said in proposing that toast. As the Professor had suggested, they were the last people to blow their own trumpets,

but he (Sir Merrik) did not think it right that their profession was only to be brought into prominence before the public eye by the fact that their oldest institution was falling down.

What were their impressions, on the Agricultural Research Council, as to their future position as a profession? They felt, he need not say, that they must have the necessary buildings and a properly-paid staff, but they also felt very strongly that their education wanted, if possible, lifting on to a university basis. Wherever possible their colleges should be linked to universities, and their research institutes wanted linking more closely to their colleges: that was their wide policy. It had been brought to their notice (their chief interest was research work) that there was a difficulty in finding the right type of man for that work, and he would ask the Royal College of Veterinary Surgeons most earnestly that night to give really serious attention to the problem—and it was a problem—as to whether it would not be possible, especially now they had got a five years' course, to make it a little easier for people who already had diplomas in pure science, to enter their profession.

Proceeding, Sir Merrik ("speaking now in my capacity as Chairman of the Board of Governors of the Royal Veterinary College") said that he was exceedingly happy to hear from Principal Hobday on the previous Monday that they had started pulling down that miserable old place. (Hear, hear.) He should like to thank everyone in that room who had helped—and who among them had not?—by gifts of money and in other ways, towards the great task they had in hand. He was grateful to private individuals for their magnificent gifts of money, to people who had helped them with equipment and other assistance at a most difficult time, and he was indeed grateful to the members of the Press, who had given them wonderful publicity.

He would conclude by saying that the profession would never have a keener friend on the Agricultural Research Council—(hear, hear)—and all he asked was that they would never hesitate for one moment, either as the R.C.V.S. as a body or as individual members of it, to acquaint him at once of any problem that struck them—anything they thought the Council might be blundering over, no matter who was right. They wanted to help the profession, and only awaited any possible extension of the opportunity to do so. (Loud cheers.)

Lord Askwith, who also responded, desired to "second the eloquent speech of Sir Merrik Burrell," which was all he felt able adequately to do, as that task had been imposed upon him during the course of the dinner, owing to the compulsory defection of Earl de la Warr. The vast amount of interest that their Royal College engendered in him was an illustration of its importance. (Hear, hear.) They had come there on various pretexts, however, and he happened to be there as President of the National Society of Greyhound Racing. It was indeed a very important industry that could attract 18,000,000 people, paying entertainment tax, to its licensed courses during the year, which was the poor man's sport, and which had brought before that profession alone a new avenue of activity, or rather developed an old industry into a new one. That was the sort of industry that should be governed, if possible, and should be put upon rules in such a way that it would be conducted in a decent manner and should not give rise to abuses and hindrances to the welfare of society. (Hear, hear.) Greyhounds were a very old institution, but the industry that had grown up had brought a new dog, as it were, into the purview of veterinary practice.

Eighteen years ago veterinary science, compared with what it was to-day, was, he ventured to say, in a low state. They had to put their backs into it during the War, and they did, triumphing over their difficulties largely by the prosecution of research. Veterinary science was of vital importance not only to the lower creation but to mankind; therefore, on behalf of the guests, he should like to endorse all that Sir Merrik Burrell had said and thank them for their entertainment that evening. (Cheers.)

The enjoyment of the company was much enhanced by vocal items delightfully rendered by Mr. Stanley Kirby (baritone) and Miss Olive Groves (soprano), while the incidental music supplied by Emilio Colombo's Orchestra was also greatly appreciated.

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

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[4123.] Civil Service Superannuation. Treasury Minute, July 7, 1932, relative to the calculation of Civil Service Pensions, etc.	0 1	0 1½

N.V.M.A. Divisional Report

DERBYSHIRE DIVISION*

MEETING AT TAMWORTH

A meeting of this Division was held at the Masonic Rooms, 29, Lichfield Street, Tamworth, on Tuesday, May 10th, with the President (Mr. H. W. Steele Bodger) in the Chair.

Members present:—Messrs. Abson, Auchterlonie, Cockburn, Evershed, Gunning, Grace, Lake, Levie, Morris, Tweed, Wilkinson and the Hon. Secretary, together with the following *visitors*:—Messrs. Matthews, Mullen, Lowe, Olver and Tullis.

Apologies for absence were received from Messrs. Deville, Bagshaw and Torrance.

A letter was read from the Secretary, North of England Division, commending their candidate for the Council R.C.V.S. It was resolved that no action be taken.

Address by the President.—In thanking the Division for his election to the chair the President, in a short address, stressed the need to the profession of co-operation and care. In the field of public health the profession was sandwiched between the medical and the sanitary authorities, and the closest co-operation was necessary in order to reserve to ourselves that part of the field which was ours.

On the question of the examination of udders, the President said that the greatest care should be taken in trying to detect abnormal conditions; he considered it good policy to take samples from all quarters showing abnormality.

A vote of thanks was accorded the President for his address.

Paper.—The President now called upon Mr. H. T. Matthews, of the City of Liverpool Veterinary Department, to present his paper entitled "Clinical Points in the Examination of the Cow for Tuberculosis." His contribution was heard with much interest and, at the conclusion of the essayist's reply, he was accorded a hearty vote of thanks. [Mr. Matthews' paper is reproduced, together with a report of the discussion upon it, at the commencement of this issue.—Ed., *V.R.*]

The company, together with their ladies, were entertained to tea on the invitation of the President, and on the motion of Mr. Tweed a hearty vote of thanks was accorded Mr. and Mrs. Steele Bodger for their hospitality.

W. J. Ironside, *Hon. Secretary.*

* Received for publication June 18th.

Canine tuberculosis is frequently manifested by whitish circumscribed areas in the lung, liver, and kidney. There are no giant cells, epithelioid or small lymphoid cells in the canine tubercle. Felines are susceptible to infection with the bovine tubercle bacillus. Parrots and canaries are susceptible to avian and human tubercle bacilli.—*Bio. Abst.*

In Parliament

The following questions and answers were recorded in the House of Commons recently:—

TUBERCULOSIS (M. SPAHLINGER'S TREATMENT)

Mr. Lennox-Boyd asked the Minister of Health whether he can make any statement as to the results of the enquiries made into and the consideration of M. Spahlinger's published formula for the treatment of tuberculosis?

Sir H. Young: On January 28th, 1932, M. Henri Spahlinger submitted to me a statement of his method for the preparation of antigens with detailed reference to tuberculosis. I sent a copy of the statement to a number of scientific authorities for their observations and similar action was taken in Scotland by the Department of Health for Scotland.

The following is a summary of these observations:—

1. All the authorities consulted draw attention to the general character of the statement and the absence of the necessary details of bacteriological technique. They regard the information supplied as insufficient to ensure that vaccines prepared by other investigators would be identical with those of M. Spahlinger.

2. It is noted that the statement does not relate to the preparation of the curative serum formerly recommended by M. Spahlinger for the treatment of tuberculosis in man.

3. The statement relates to the use of vaccines for the immunization of human beings and cattle against tuberculosis, and it is desirable that the value of these vaccines should be supported by experimental proof.

4. The Medical Research Council and the majority of the other authorities consulted consider that if a sufficient quantity of bovine vaccine can be supplied by M. Spahlinger the question of its experimental trial on animals might be considered. To render such tests practicable detailed information from M. Spahlinger in regard to dosage, methods of administration and standardisation would be required.

5. The authorities consulted considered that a clinical investigation of the immunizing value of human vaccines in human beings on the evidence available would be undesirable.

6. It is understood that the Ministry of Agriculture and Fisheries are in communication with M. Spahlinger concerning arrangements for an experimental trial of the bovine vaccine on animals, and also concerning the details of the method of preparation and administration of the bovine vaccine.

The Ministry of Agriculture and Fisheries state that M. Spahlinger has undertaken to supply a sufficient quantity of the bovine vaccine for the experiment as soon as it can be prepared.

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CATTLE DISEASE

Lord Scone asked the Minister of Agriculture if he will state the areas in which the disease of cattle known as nervous syndrome is prevalent; and what steps are being taken to ascertain the cause, nature, and cure of this disease?

Sir J. Gilmour: I presume that the Noble Lord refers to the disease of dairy cows to which reference has been made recently in the Press. Attention has been directed to its existence in the districts around Lechlade and in Berkshire, but it is common in many parts of the country and abroad. As regards the second part of the question, this disease condition formed the subject

of a question by the hon. Member for Don Valley (Mr. T. Williams) on June 21st, and I would refer the Noble Lord to the reply given thereto, of which I am sending him a copy.

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FOOT-AND-MOUTH DISEASE

Mr. Guy asked the Minister of Agriculture if he has considered the representations of the Highland and Agricultural Society of Scotland on the question of prohibition of importation of vegetables from Continental countries in which foot-and-mouth disease is prevalent; and if he is prepared to take any action to deal with this question?

Mr. Hannon asked the Minister of Agriculture what measures he proposes to take with regard to the resolution sent to him by the Highland and Agricultural Society of Scotland regarding foot-and-mouth disease and the importation of vegetables from foreign countries?

Mr. Womersley: The resolution referred to has been received, but the position with regard to this matter has not changed since the reply given on December 7th last to a question on the subject by my hon. Friend the Member for Devizes (Sir P. Hurd). The questions raised in the resolution have been dealt with in some detail in a letter which my right hon. Friend has sent to the society, and a copy of this communication is being sent to my hon. Friends.

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SLAUGHTERED CATTLE (STATISTICS)

Mr. L. Jones asked the Minister of Agriculture the total number of cattle slaughtered in England for human consumption for the 12 months ending May 31st, or the nearest convenient date?

Sir J. Gilmour: The estimated numbers of fat calves sold for slaughter off agricultural holdings in England and Wales during the year ended May 31st, 1931, were 1,322,000 and 808,000 respectively. Corresponding figures for the year ended May 31st, 1932, will not be available until about August next. In addition approximately 279,000 fat cattle were imported for slaughter during the same period.

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ANIMAL (SLAUGHTER)

Lieut.-Colonel Moore asked the Secretary of State for India if he is aware that the animals slaughtered for the food of our European troops in India are killed by having their throats cut by Mahommedan butchers; and will he take steps to ensure that these animals are first rendered unconscious by the use of a mechanical killer, similar to the system adopted by the Army authorities at home?

Sir S. Hoare: The reply to the first part of the question is in the affirmative; the Government of India have fully investigated the matter on several occasions, and have decided that the present system must continue, every effort being made to ensure that it is carried out as humanely as possible.

Lieut.-Colonel Moore: Is my right hon. Friend aware that under the present system these animals have two minutes or more of extreme discomfort and pain, and will he not consider the British method of using the humane killer?

Sir S. Hoare: It is a very difficult question, owing to the fact that most of the butchers are Moslems, and Moslems, as my hon. and gallant Friend knows, have certain religious convictions.

Lieut.-Colonel Moore: Will my right hon. Friend remember that I was referring to meat killed for British troops, not meat killed for Moslem troops?

Sir S. Hoare: I think my hon. Friend misunderstands me. The meat is killed by Moslem butchers, whether it is for British or for Indian troops.

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CRUELTY TO ANIMALS (PROSECUTIONS)

Mr. Hutchison asked the Home Secretary whether he will take steps to give power to benches of magistrates before whom cases of gross cruelty to animals are heard to order a medical examination of the prisoners whom they may decide to convict before sending them to prison?

Mr. Stanley: No, Sir. Magistrates can already obtain a medical examination in all cases where they consider it desirable.

Mr. Hutchison: Are the magistrates not entitled to send criminals of this type to Broadmoor?

Mr. MacPherson: Will the Under-Secretary see to it that the Department will extend no leniency of any sort or kind to anyone guilty of such gross cruelty to animals?

Mr. Stanley: Obviously, any action which my right hon. Friend takes will always depend upon the circumstances of the case. I can give no assurance with regard to a hypothetical case.

Sir Robert Gower asked the Home Secretary whether his attention has been called to the case of Frederick Kay, who was recently convicted and sentenced to imprisonment by the Romford justices for beating a dog to death; and whether, in view of this and other cases of cruelty to animals, he will consider instituting legislation authorising courts to inflict the penalty of flogging upon persons so convicted and also forbidding the further issue to them of licences to keep dogs?

Captain Spencer asked the Home Secretary whether he will consider introducing legislation with a view to making more drastic the penalties imposed on persons convicted of cruelty to animals and preventing the further issue of dog licences to such persons?

Mr. Stanley: The attention of my right hon. Friend has been drawn to the case in question. He could not undertake to introduce legislation on this subject.

Sir R. Gower: Is the Under-Secretary aware that the man informed the court that within the last few years he had killed seven other animals in a similar fashion, and could he not introduce some form of legislation which would deprive the man, and others similar to him, of the right to own dogs in the future?

Mr. Stanley: The question has been very carefully considered, and there are almost insuperable difficulties in the way of introducing legislation. With regard to the other part of the hon. Member's question relating to flogging, I would point out that, in this particular case, the man was 60 years of age, and, obviously, flogging would not be a suitable punishment.

Sir R. Gower: Will the Under-Secretary tell me what are the insuperable difficulties?

Mr. Stanley: I could not do that within the limits of a Parliamentary answer, but, if my hon. Friend would like to discuss the matter with me, I shall be glad to do so.

Mr. Thorne: Is the hon. Member not aware that the man in question had been to Church on the same morning?

Mr. Maxton: Does the Under-Secretary regard the flogging of a man as a more moral action than the beating of a dog?

In the House of Lords on July 7th, the Earl of Kinnoull asked whether His Majesty's Government's attention had been drawn to recent prosecutions for cruelty to dogs, and whether action could be taken to ensure that a dog licence should not be issued to any person who had been convicted of cruelty to dogs or other animals and punished by fine or imprisonment.

Lord Danesfort moved to resolve, "That this House expresses the hope that the Government will, as soon as may be, introduce legislation authorising Courts to cancel any licence to keep dogs issued to persons convicted of gross cruelty to dogs, and to forbid the further issue to such persons of any licence to keep dogs." The noble lord said that the Home Office stated that there were insuperable difficulties in the way of introducing such legislation. He did not believe that there were any difficulties that could not be overcome.

The Earl of Onslow hoped that the Government would accede to these two requests.

Lord Banbury and Lord Daryngton supported the motion.

The Earl of Lucan, Captain, Gentleman at Arms, replying for the Government, said that it was not from want of sympathy that the Government could not see their way to bring in legislation such as was suggested in the motion. The administrative difficulties were considerable. A dog licence was not like a motor licence, but could be obtained merely by walking into one of the 12,000 money order offices in the country. The police would be faced with the difficulty that any member of the family of a man who had been convicted of cruelty to a dog could get a licence. The proposals of the noble lords would also involve considerable expense as administrative staffs would have to be increased. It had not been brought to the notice of the Government that there were repeated cases of cruelty to dogs. Another difficulty was that certain dogs were exempt from being licensed. Altogether the difficulties were greater than the Government were prepared to undertake. They regretted very much that they could not undertake to bring in legislation.

Lord Ponsonby said that he was disappointed with Lord Lucan's speech. He could not believe that the difficulties were insuperable. The licence of anyone who was guilty of cruelty such as had been described should be endorsed, and no one should be able to get a licence without producing his former one. There should be a black list of such persons. There would not be more than a score of names on it, and it could easily be circulated among those who issued licences up and down the country.

Lord Danesfort said that Lord Ponsonby's was an admirable suggestion and got over many of the difficulties which had been suggested. Those difficulties could and ought to be got over.

The motion was agreed to.

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House of Commons Questions (continued).

EXPERIMENTS ON LIVING ANIMALS

Mr. Groves asked the Home Secretary how many visits to registered laboratories were paid by the two inspectors under the Act, 39 and 40 Vic., c. 77, during 1931; and what was the total number of experiments upon living animals and the number of other experiments?

Mr. Stanley: The number of visits was 745. The number of experiments performed during the year will be given in the annual return which is in course of preparation and will, I hope, be issued shortly.

Mr. Groves: Before the Recess?

Mr. Stanley: I could not say within a day or two. It is approaching completion.

Mr. Groves asked the Home Secretary what steps are taken to ensure that the Cruelty to Animals Act, 1876, is observed, and that students are not allowed to undertake vivisection experiments for which they do not and cannot under the Act hold a licence; and whether his Department has taken any legal steps against such students during the last five years?

Mr. Stanley: The report prefixed to the annual return of experiments indicates the steps which are taken to secure observance of the Act. In addition the Home Office has always been able to rely upon the active co-operation of the responsible heads of laboratories, medical schools, etc., in ensuring that experiments are not performed by unauthorised persons. The answer to the last paragraph is in the negative; the Home Office has had no reason to suppose that any such contravention of the Act has taken place within the period indicated.

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MINISTRY OF HEALTH (MEDICAL OFFICERS)

Major-General Sir Alfred Knox asked the Minister of Health how many whole-time regional medical officers are employed by the Ministry; and what are their duties and salaries?

Sir H. Young: As the reply to my hon. and gallant Friend is necessarily lengthy, I will, with his permission, circulate it in the *Official Report*. *Following is the answer:—*

The numbers and annual salaries of the officers in question are as follow:—

> Four divisional medical officers on the scale of £1,440—£1,600. Thirty-five regional medical officers on the scale of £1,000—£1,400. Forty-three deputy regional medical officers on the scale of £800—£1,100.

These salaries are inclusive, that is to say no cost-of-living bonus is payable on them; and they are at present subject to abatements varying from 10 per cent. to 7½ per cent. in accordance with decisions of His Majesty's Government. The chief duty of the regional and deputy regional medical officers is to examine insured persons certified as incapable of work and referred for a second medical opinion either by approved societies on the question of incapacity, or by insurance practitioners for purposes of consultation. The bulk of their emoluments is accordingly repaid by societies as an appropriation in aid of the Ministry of Health Vote. These officers also inspect the medical records kept by insurance practitioners, and (on behalf of the Home Office) the Dangerous Drugs registers kept by medical practitioners and hospitals; they interview insurance practitioners on questions relating to prescribing; and from time to time make other inquiries and reports required in the administration of the insurance medical service.

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MUSK RATS (SURREY)

Mr. Touche asked the Minister of Agriculture if he can give any further information as to the presence of musk rats in Surrey and as to the steps which have been taken to exterminate them?

The Minister of Agriculture (Sir John Gilmour): Since I replied to the question put to me by my hon. Friend on June 20th on this matter, no further musk rats have been seen in this neighbourhood, although a careful watch has been kept in the locality. This would seem to indicate that this infestation is, fortunately, not of a serious character.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

DIARY OF EVENTS

July 18th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

July 22nd.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds.

July 22nd. — Summer Meeting of the Lancashire Division, N.V.M.A., at the Harper Adams Agricultural College, Newport, Shropshire.

July 29th.—Meeting of the Royal Counties Division, N.V.M.A., at the Zoological Gardens, Whipsnade.

Aug. 8th-13th.—N.V.M.A. Jubilee Congress at Folkestone.

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DANGEROUS DRUGS: WARNING TO MEMBERS

Our readers are informed that a certain member who has been convicted of an offence under the Dangerous Drugs Act, has been calling upon other members with a request for tr. opii. As all chemists have been warned not to supply this member with dangerous drugs, any such request should be refused. In any case, as all readers are aware, their stocks of dangerous drugs must be recorded in the prescribed manner in a register, so that the use of the drugs may be traced.

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R.C.V.S. OBITUARY

Paley, Robert William, Belmont, Lichfield Road, Sutton Coldfield. Graduated Edinburgh, December 17th, 1928; died July 9th, 1932, aged 27 years.

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Powell, Charles Ault, The Sandhouse, near Woburn, Bletchley. Graduated London, May 14th, 1895; died July 1st, 1932, aged 60 years.

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Young, Harry Ashley, The Causeway House, Dunmow, Essex. Graduated London, March 28th, 1883; died July 9th, 1932, aged 69 years.

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PERSONAL

Marriage.—Dawson—Imrie.—At the Memorial Chapel, Glasgow University, on July 5th, 1932, by the Rev. Alex. Maclellan, Colston-Wellpark Church, Glasgow, assisted by the Rev. John R. Macpherson, M.A., Kinlochleven (brother-in-law of the bridegroom), and the Rev. David Kater, M.A., Maryhill High Church, William M. Dawson, M.A. (Hons.), only son of the late William R. Dawson and Mrs. Dawson, Lynwood, Maryhill Park, to Jeanie Paul, M.A., daughter of Mr. David Imrie, M.R.C.V.S., and Mrs. Imrie, Nithsdale, Bishopbriggs.

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We desire to extend our felicitations to Mr. Walter Perryman, M.R.C.V.S., of Croydon, upon the conferment on July 4th, at Leeds University, of the Degree of Bachelor of Arts with Honours upon his younger son, Mr. Walter Jeffrey Perryman.

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N.V.M.A. Staff Re-visit Maidenhead.—In glorious weather the staff of the N.V.M.A. and their ladies, on Sunday last, enjoyed to the full a repetition of their delightful experience of the previous year, in visiting Maidenhead as the guests of the President and Mrs. P. J. Simpson. The pleasure of the warm hospitality extended to the company at "Shirley" was enhanced by a visit to Windsor as a prelude to a much-appreciated motor drive through the Royal Park to Virginia Water (where tea was taken) and on through the beautiful moorland and pine country of the district.

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A VISIT TO ALFORT

The attention of our readers is drawn to the Royal Veterinary College announcement on Advertisement page xiii in which particulars are given of a visit to the Alfort (Paris) Veterinary School which is being arranged from July 23rd to 26th. It is hoped that many practitioners and students will take advantage of this opportunity to visit (at an inclusive cost of £5) one of the finest veterinary institutions on the Continent.

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U.S.A. MAIL CANCELLATION SLOGAN

"A special reminder to humans to be humane was the slogan cancellation, Be Kind to Animals, used on Canadian mail during National Be Kind to Animals Week, April 18th to 23rd. Apropos of this reminder is the American Humane Society suggestion that we be sure to be kind to animals always—not just for one week each year," says the *North American Veterinarian.*

"The United States Post Office Department, formerly a frequent user of the slogan cancellation form of national reminder, has abandoned the practice for general use because of inability to comply with the flood of requests for special slogan cancellations for various events. Only Post Office Department matters are now the subjects of these special cancellations in the United States."

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The National Milk Publicity Council reports that the ten-week trial tour of its travelling kinema van has been concluded, and the demonstration was well received everywhere. At the 162 general displays 48,075 adults and 15,365 children were present, and eleven displays were given to 5,900 school children. The Council has given instructions for a new film to be prepared, for display during a tour through industrial rather than rural areas.

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Edward Hodgson, butcher, of Scholes, Cleckheaton, was fined £100 at Bradford for slaughtering a cow for human consumption without giving notice; for not giving notice that part of the carcass was diseased; and causing the carcass to be removed before the permission of the authorities had been obtained.

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At Axminster Rural Council a member asked what steps were taken to see that meat unfit for human consumption was not sold, to which the Sanitary Inspector replied there was not a butcher in the district who, if he found anything wrong with his meat, would not ring him up immediately. They were perfectly willing to work with him, and during the 21 years he had been there only one prosecution had taken place.

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Sir Robert Greig, of the Department of Agriculture for Scotland, has opened a new milk-condensing and canning factory at Galston, the plant for which has been erected by Galston and District Co-operative Farmers' Association. He said the medical profession must largely share the blame for creating the demand for canned milk. They dwelt too much on the risks of drinking ordinary milk and too little on its advantages.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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CONGRESS TICKET APPLICATIONS

FROM THE PRESIDENT, N.V.M.A.

To the Editor of the Veterinary Record.

Sir,—Despite the excellent notices appearing in the *Veterinary Record* urging those who intend to be present at the Congress at Folkestone to apply at once for tickets for the various functions they wish to attend, may I put in a personal appeal that this will be carried out?

It is an impossibility for our hard-worked local Hon. Secretary to make his arrangements and to give the necessary guarantee to caterers, motor-coach companies, etc., to obtain special terms unless early replies are received. In the case of my reception the same difficulty in knowing how many to cater for crops up, and I must with reluctance state here that *no* tickets for this function will be issued after August 4th. The time limit for the issue of other tickets remains in the hands of the Executive Committee. It is surely not only a matter of business but an act of courtesy to those who voluntarily give so much of their time and put in so much work to make the Congress a success, to endeavour at the earliest opportunity to accede to their request.

I am, Sir,

Yours faithfully,

P. J. Simpson.

Shirley,
Castle Hill,
Maidenhead.
July 10th, 1932.

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CALCIUM TREATMENT OF MILK FEVER

To the Editor of the Veterinary Record.

Sir,—I wish to thank Mr. Golledge for his communication on the above subject, and if a few more practitioners will take the trouble to record their experiences, we may arrive at some definite conclusion as to the best method of applying the treatment. Mr. Golledge states that I have not described the technique which I adopt, but if he will refer to my last letter, he will find that I have expressly stated that, in the cases to which I referred, the treatment and technique was that as advised by Mr. Hepburn, F.R.C.V.S., in the issue of the *Record* for April 2nd. I notice that Mr. Golledge does not filter, nor consider it necessary. This is exactly the converse to the statements made by Mr. Hepburn. I may state that I have used this treatment, both filtering the preparation and not filtering; and when it first came out I used the preparation in the ampoule form, sent out by the makers—in this latter case, with no success. I employed distilled water, owing to the fact that the water in this district is very chalky—I considered, rightly or wrongly, before doing so, that the use of ordinary water, and not filtering, might be responsible for the abscess formation observed.

At the recent Annual General Meeting of the Southern Counties Veterinary Medical Association an interesting discussion took place on this subject, with supporters of both the calcium and inflation of the udder lines of treatment; and at the previous meeting of this Society, when we were honoured by the presence of a very well-known and distinguished member of the profession, he told me afterwards that he had never yet got a cow up with calcium gluconate, and he did not consider it of any value whatsoever. I wish he would write on the subject to these columns.

I therefore agree with Mr. Golledge that it is "high time that the controversy over this so-called new treatment ended," but for the reasons stated in my last letter I am, at any rate for the time being, reverting to "the crude and out-of-date treatment of inflating the udder."

I do not like doing so, but I also do not like having to carry out additional treatment of a surgical nature afterwards; nor can I, in these days of competition and undercutting of prices, afford to lose clients, who are rightly annoyed at the after effects of the treatment. In conclusion, I may add that, whenever I have used calcium gluconate, I have used it subcutaneously, and on the lines recommended by others.

Yours faithfully,

J. F. D. Tutt, M.R.C.V.S.

1, St. Cross Road,
Winchester.
July 9th, 1932.

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HUSK IN CATTLE

To the Editor of the Veterinary Record.

Sir,—How is the infection carried over from one season to another? I do not remember reading an explanation of this, or of a discussion on the point. I have had outbreaks in May, but one does not expect the disease to crop up much before August. It soon disappears after a few sharp frosts late in the autumn. Only once have I diagnosed the disease as husk (in thirteen six months-old calves) in January. None died, so I could not verify the diagnosis.

Yours faithfully,

Wm. T. D. Broad, M.R.C.V.S.

Marlborough,
Wilts.
July 10th, 1932.

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DENTAL ANÆSTHESIA IN THE DOG

To the Editor of the Veterinary Record.

Sir,—In reply to queries regarding the types of Ash's forceps that I recommend for canine patients, I am writing to state that I use the following (all Ash's line of forceps bear a distinctive number stamped on the handles):—Nos. 29, 74, 154, 1 and 112. I also use as bayonet forceps that of S. S. White: English No. 104. These can be obtained through any instrument firm.

As to scalers and excavators, the choice depends upon the whim of the operator. The range of choice is extensive, and I cannot very well single out any particular pattern.

The great advantage of Ash's forceps is that the tips of the blades meet closely; moreover, they are practically unbreakable and last for years. No. 74 is excellent for molars, especially the lower. No. 112 is also a bayonet pair and will remove teeth broken off level with the gum.

Yours faithfully.

J. F. D. Tutt, M.R.C.V.S.

1, St. Cross Road,
Winchester.
July 11th, 1932.

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Royal College of Veterinary Surgeons: Annual Dinner, 1932, at the Hotel Victoria, W.C.

College of Veterinary Surgeons: Annual Dinner, 1932, at the Hotel Victoria, W.C.

Photographed by Swaine, London, W.1.